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—H. G. Wells in
"The World of William Clissold."

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POTASH

Better Crops

The Pocket Book of Agriculture

The Whole Truth—Not Selected Truth

VOLUME VII NUMBER FIVE

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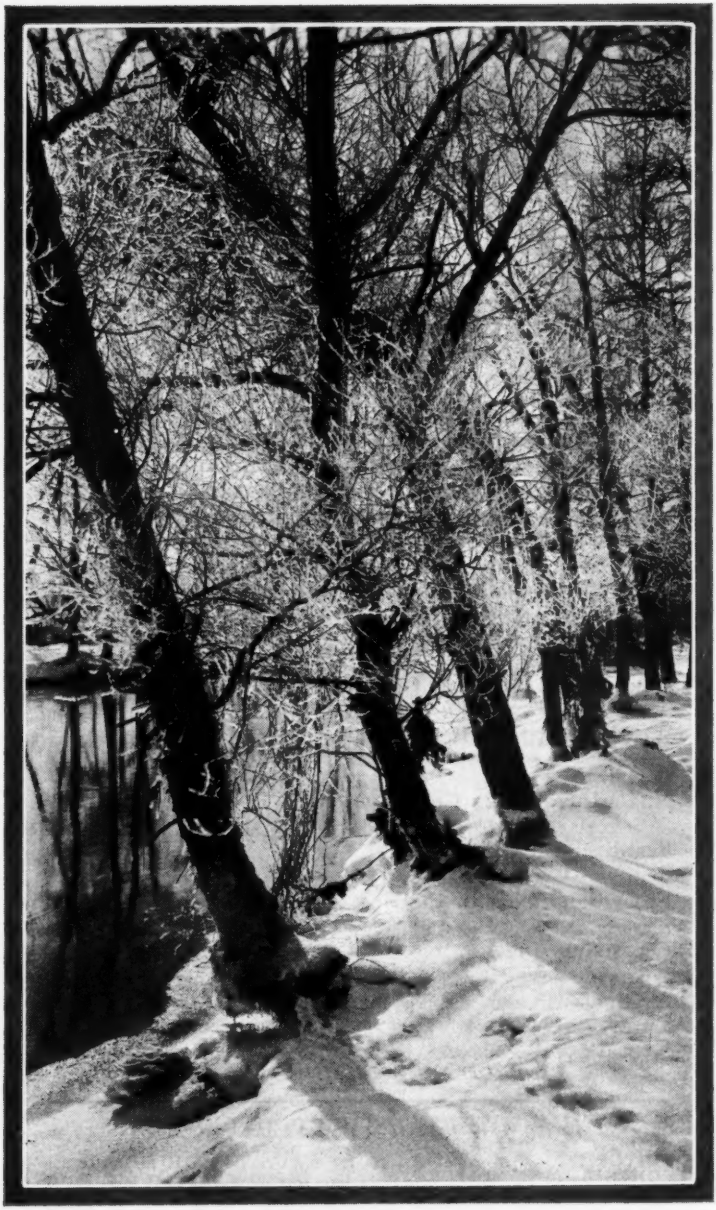

The Frolic Architecture of the Snow

—*Emerson.*

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Facts are facts, not

KNOWLEDGE

By

Jeff McDermid

IN a famous magazine I find a list of twenty questions; I reproduce them for you on the next page. The headline over this list of queries demands: "What Do You Know?" And an explanatory note announces that you should try to get the answers down in five minutes, or, failing to dig all of the correct solutions out of your mind, you are invited to buy next week's edition in which you will find the proper answers.

As a contest method for forcibly increasing the circulations of unwanted magazines this is probably as good as any. But it creates in the formative minds of many struggling young folk a wrong and dangerous attitude toward knowledge.

The reader of the magazine, none too well read, but "ambitious as Caesar" is liable to feel that he is grossly at fault somewhere if the answers to this potpourri of unrelated questions do not shoot out of his mind like the sparks from a Fourth of July sparkler!

From the cavernous depths of his brain he believes he should fish up at once the answer to a question like "how many cylinders has a Rolls-Royce?"

I know a New Englander who, bred to the stunt from early childhood, always answers your ques-

tion with a few of his own. He is happy, moderately well off, possesses a B.A., and is known locally as quite a philosopher. Often, during the summer seasons, has he taken to the Chautauqua circuit with some delight and profit to himself, and considerable pleasure to his audience.

If you were to ask him: "How many cylinders has a Rolls - Royce?" like as not he would look at you through his crackling, pale blue eyes and ask, "What is a Rolls-Royce? Why should it have cylinders? Does it always have the same number?"

But if he thought you were really in earnest he would skip lightly into his study and be out again in five minutes prepared to read you a lecture on the subject. For in his library he has "reference knowledge" on thousands of subjects.

As for this list of questions: if I had an employee who could successfully negotiate the answers to all of them in an hour, (without recourse to books) I would fire him quicker than scat—his easy success with this hodge podge list would but prove to me that his mind was a rubbish heap of unrelated, unimportant *facts*, not knowledge.

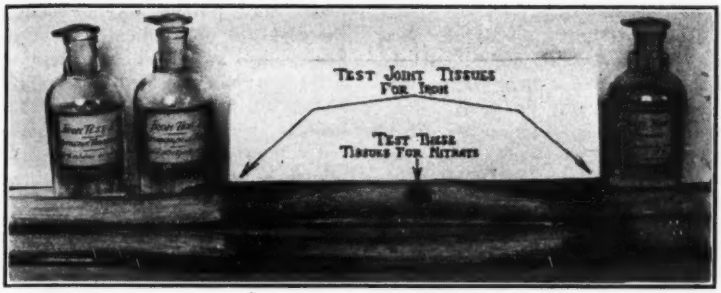
1. *What motion picture director invented the close-up?*
2. *How far did Gertrude Ederle swim in crossing the English Channel?*
3. *How many cylinders has a Rolls-Royce?*
4. *At what place can a ship sail eastward from the Atlantic into the Pacific?*
5. *When and where did George Washington do his famous "cussing?"*
6. *What is the lowest dry land region on the earth's surface?*
7. *What men besides George Washington were known as "The Father of their country?"*
8. *What book is really Charles Dickens' autobiography?*
9. *What major league baseball pitcher holds the record for games won in one season?*
10. *What is considered a good drive for a woman golfer?*
11. *Can you name the four kinds of venomous snakes found in the United States?*
12. *How many of a horse's feet are on the ground at once when it is trotting?*
13. *What Presidents were bachelors?*
14. *What is the world's record for a mile by an automobile? A speed boat? An airplane? A runner? A swimmer? A horse?*
15. *Give the name of the present Pope and that of his predecessor. Also their names before election.*
16. *Where, when, and why was Nathan Hale executed? What were his last words?*
17. *How many names are signed to the Declaration of Independence? Who was the oldest signer? The youngest?*
18. *Do wives or husbands get divorces more frequently in the United States? What is the commonest cause of divorce? In what year after marriage are divorces most numerous?*
19. *What three countries have the largest military man power in the world?*
20. *When was the typewriter invented?*

For facts are not knowledge, any more than nuts and bolts are a Cadillac.

And I'll tell you now, as to myself, that as a test I could only answer the first, eight and sixteenth questions out of my mind. But, in just eight and a half minutes by the watch, I had the correct answers to the other seventeen. By simply referring to the Encyclopedia, the New York World's Almanac and my copies of "The Volume Library" *I found the facts.*

I do not know who first introduced the idea that unless a person can answer in a certain length of time a list of useless questions of fact he is a moron, or even a submoron—a submoron, according to "The Cynic's Dictionary," being one who is forced to use an extension ladder to climb up to a

(*Turn to page* 61)



The chemicals used in the corn stalk test and places where they should be applied

Potash Cures Corn Root Rot *and* Improves Yields

By C. T. Gregory

Purdue Agricultural Experiment Station

TEN farmers of Cass county, Indiana, gave the new corn stalk test a trial and found that it works just as G. N. Hoffer of the Purdue Experiment Station had assured them it would. These farmers each applied a mixture of 100 pounds of 44 per cent phosphate and 100 pounds of muriate of potash to an acre of corn. A part of the corn in the same field was not fertilized but had to depend on the fertilizer residue from previous crops of wheat and clover. This test was a comparison, then, of usual corn growing practices and the new methods of corn fertilizing as directed by the stalk test.

Ed Lybrook's corn field was a heavy clay soil. The stalk test showed rather heavy accumulations of iron in the joints, indicating a need for potash. A similar test on the potash fertilized acre revealed the fact that the iron had not accumulated in these stalks to any appreciable extent. So far so good, he had proved at least that the potash would keep the iron out of the joints. The yield told the same story because he raised a little better than five bushels more of thoroughly matured corn on the potash plot than he did on the unfertilized part.

R. V. LYBROOK increased his yield 6.6 bushels per acre by the same treatment on the same kind of soil. J. L. Ledgard's corn had somewhat heavier deposits of iron in the joints, indicating a greater need of potash, and the increase in yield was almost eight bushels per

acre.

Elmer Elliott, on light clay, raised his yield nine bushels. Frank Tyner and Geo. Banta, who planted their corn on muck, found that they had increased their yields nine and eight bushels per acre, respectively. On Claude Pavey's black sand, 100 pounds of potash increased the yield 20 bushels. Even sweet corn responded to the treatment, for F. J. Wall increased the yield on his truck farm 5.2 bushels per acre.

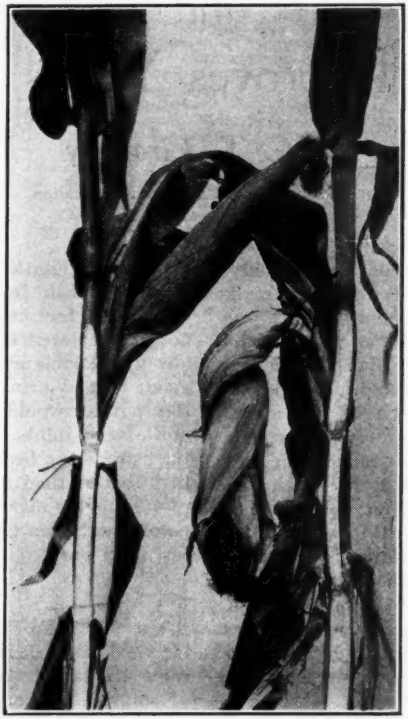
In every case the stalks of the unfertilized corn showed heavy deposits of iron in the joints. In every case this iron practically disappeared in the potash fertilized plots. Of course, it did not disappear from the soil because there was just as much iron in one plot as in the other. The difference was that the potash had prevented the accumulation of the iron in the joints. This is exactly what Hoffer has been saying for the past two or three years.

I said at the beginning that 10 Cass county farmers had tried this test but have reported only on eight. There were two more farmers, E. J. Zeck and Carl Miller, who used the potash even though the test did not indicate its need. Zeck only increased his yield a little less than one bushel per acre. Miller did a little better, with 1.9 bushels increase. In neither case is the increase significant. At first glance it would appear as if these results cast some doubt on the Hoffer stalk test, but actually they furnish the best evidence that it works.

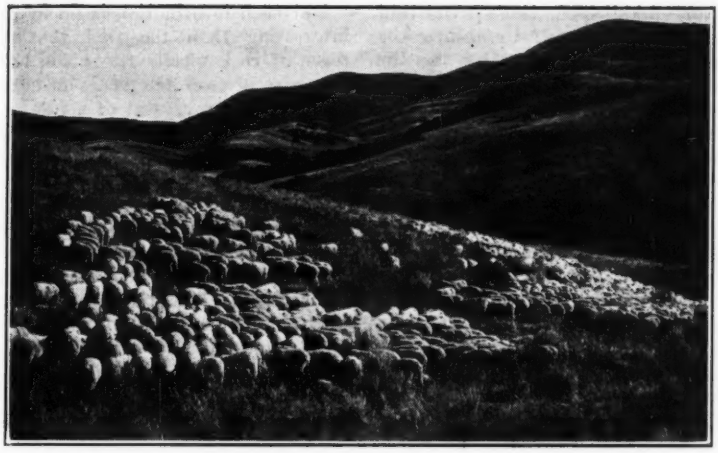
The stalk test in Zeck's corn showed no signs of iron accumulation, indicating that he has plenty of available potash in his soil and that further applications are unnecessary. Nevertheless, he applied the extra fertilizer. The results were exactly what the test predicted. When the corn plant has as much of any one of the fertilizer elements as it can use, more will do no good. Miller's corn test was just about the same as Zeck's and the increased yield did not differ more than a bushel per acre. In other words the indications from the stalk test were not to use more potash and the corn yields proved that the test was right.

This Hoffer test is a real

(*Turn to page 53*)



Make the test any time after the ear is well formed (left) until mature (right)



An effective way of utilizing waste hillsides

Eliminating the Waste *in* Agriculture

By Dr. Robert Stewart

Dean, College of Agriculture, University of Nevada

EVER since the agricultural depression of 1920, there has been almost constant discussion of the value and necessity of co-operative marketing associations as a means of saving the situation for the farmer.

Farmers have condemned agricultural leaders for teaching how to increase crop yields by efficient production when the problem as one farmer so vigorously says, "is not how to produce two blades of grass where one grew before, but the problem is rather how to market the *one* blade which is produced at a profit." And, most of the agricultural leaders of the country have not only accepted the indictment, but have actually endorsed it!

This happy condition, in the minds of most farmers, is to be brought about by means of cooperative marketing associations, which will function in some mysterious way by eliminating the

many middlemen, thus permitting the farmer himself to absorb the middlemen's profits. "How can the farmer get a larger share of the consumer's dollar?" seems to be the slogan. This state of mind of the farmer is further aggravated by many ill advised and unfortunate illustrations which are made by the agricultural press, politicians and would-be farm uplifters.

It means nothing to the intelligent farmer to be told that a watermelon for which he receives only 15 cents is cut up and sold for 30 cents a slice in a restaurant in Chicago and brings in $4.00. The knowledge that a crate of celery for which a farmer receives 40 cents in Norfolk, Virginia, is retailed for $2.60 by a groceryman in the Bronx, is of no value to him.

The fact that a bushel of wheat, for which the farmer receives $2.00 when served in the form of puffed wheat in the dining car of the palatial limited train brings in $560 is an interesting one. It is also interesting to know that there are 33,000,000 people in the United States who get their living by producing farm products and that there are 19,000,000 who get their living by helping market them.

But such information is no more interesting than the fact that a piece of rock quartz for which the miner receives a few cents is converted into the crystal of a powerful telescope worth hundreds of thousands of dollars to the scientist.

Such information also is valueless in pointing out to the farmer how he may make *more profits!* The way in which such information is usually presented to the farmer only antagonizes and inflames his mind since direct sale of farm products to the consumer is impossible in any large way.

The farmer may substitute his own agents for the present middlemen but the function performed by them represents a necessary service in the marketing of farm products and cannot be taken away or performed by the farmer himself.

The history of unsuccessful cooperative marketing associations in the United States is largely a record of attempts to eliminate the middlemen and to substitute therefor the agents of the farmers.

THE history of successful cooperative marketing associations is

This clover failure on poor land might have been avoided by using fertilizer

largely a recital of a constant successful fight to eliminate waste in the scientific production and merchandising of farm products.

C. F. Kettering, President of the General Motors Research Corporation, in a recent address very aptly said, "In research we simply start in to find out what is wrong with something and then fix it." This method of procedure applies equally as well to the agricultural problem. What is wrong with agriculture? What is the solution? What can be done to increase profits?

The successful business man in any industry maintains his profits by constantly striving to reduce the cost of production and also by the efficient merchandising of his product. He attempts to reduce the cost of production by efficient management of the factors of production and by the elimination of waste, not only the waste of material but also of time and labor.

One of the things which is wrong with the agricultural industry is the tremendous waste which occurs. There are various ways in which economic waste occurs in the production, transportation and marketing of farm products, which if they occurred in any other industry would wreck it. A careful consideration of these wastes indicate that they can be controlled and in many cases entirely eliminated.

What is ordinarily thought of as waste such as loss from decayed fruit and vegetables is a small item compared with other more important wastes which occur all along the line.

THERE is marked economic waste in time and labor in the production of many farm crops. The maximum possible labor period involved in the production of a crop of wheat is about 120 days. There are 365 days in a year; there are 52 Sundays and three general holidays. The single crop wheat farmer must, therefore, be idle about 190 days out of the year.

A similar condition prevails in the production of cotton and in many cases with the production of rice and alfalfa. On some of the government reclamation projects many of the farmers are in real distress. Yet, 90 per cent of the entire area on some of these projects is in a single crop of alfalfa and the farmer of necessity must

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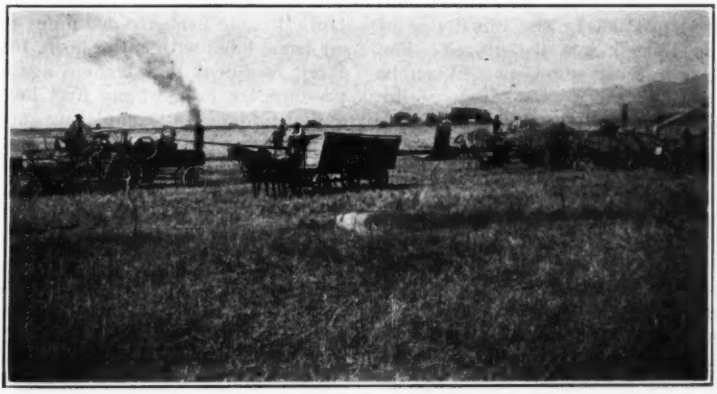


An efficient method of harvesting the wheat crop saves labor and expense

Showing some of the methods used by P. D. Fulwood whose annual sales from 200 A. amount to $30,000

Making the Farm

By F. C. Chandler

County Agent, Tifton, Ga.

"I SAT for two solid hours in his office," said J. D. Cook in telling me of a visit to the State Experiment Station to consult the boll weevil specialist, "and asked him two questions. The remainder of the time I was listening to him answer those questions. When he had finished I could not realize that time had slipped by as it had. But I left there thoroughly convinced that we could still produce cotton though the boll weevil had destroyed four crops in succession for us.

"I had endeavored to so change my system of farming as to preclude the necessity of cotton for a cash crop but the results had never been very satisfactory. This man had so thoroughly convinced me that it was possible to raise cotton under boll weevil conditions if one were content to make use of the knowledge he could obtain in controlling the boll weevil and include in his farming plans methods of intelligent boll weevil control. I came back the 200 miles to my home filled with enthusiasm, for I felt confident that I could again produce the crop of my first love and profits. In completing my program for the year I included in it a search for every available bit of information on methods of boll weevil control."

THE above conversation took place soon after I came on the job as County Agent in Mr. Cook's county and while we were waiting for the dinner bell.

I had driven out to Mr. Cook's farm early in the morning on that

Dusting helped to make 179 bales of cotton on 170 acres for J. D. Cook. Tenants made only 170 bales on 330 acres

Pay for Brains

¶ It pays to repeat experiences like these

July day and had found Mr. Cook sitting in his car out on a field road in the middle of one of his large cotton fields watching the operation of a three-row dusting machine. "This machine has been operating steadily night and day for the past three days," said Mr. Cook after greetings were over. "I find that it is necessary if I am to keep my cotton dusted properly at this time. I realize that the best time of the day for this work is late in the afternoon, night, and early morning. But with the blast generated by the fan on this machine the dust is forced all through the plant and plenty of it sticks —as you will note when you look at it with this glass—to get any weevils present."

From 400 acres of cotton Mr. Cook gathered that year 275 bales of cotton while on neighboring farms one bale to three acres was a high average.

After the harvesting season was over I was again talking to Mr. Cook. I asked him what he had done that might show that the farm would pay for intelligent direction. In reply he said, "This year I operated 22 plows on my farm; seven on my individual crop and 14 share croppers. With the seven plows I made 179 bales of cotton, 2,000 bushels of corn, 4,000 bushels of oats and 18,000 pounds of tobacco, while the 14 share crop plows which I did not give as close supervision made 171 bales of cotton and 19,000 pounds of tobacco. Thus my wage hands produced an average of over twice as much cotton and tobacco per individual as did the croppers and in addition

produced enough food supply crops to operate my place another year."

Mr. Cook was a one-horse farmer in Middle Georgia when he started farming for himself some 25 years ago and moved to this county 20 years ago. Since coming here he has developed his farming business to where it produces a gross revenue close to $50,000 per year in addition to supplying his farm with food crops.

"I AM operating 200 acres of land with one pair of mules," said P. D. Fulwood in answer to my question as to the extent of his farming operations. "I look after the business end of the operations, make the program and plans for operating the business, and hire labor to carry out the details of the plan. I use a tractor for preparing the land and put it in such a state of tilth that it minimizes the amount of cultivation needed for the plants before marketing. The seed I plant with a horse-drawn drill. I haven't enough patience to watch the negroes work so I delegate that to my field foreman.

"This car of sweet potatoes," he was loading a car of potatoes which he had asked me to find a market for, "was produced as a catch crop to keep my labor employed between the Spring and Fall plant seasons. I had this 28 acres in spring cabbage plants and set the sweet potatoes after I had sold off the cabbage plants. I rented this for the year for growing plants in the spring and will harvest some 4,000 bushels of sweet potatoes as my summer crop. Most of these I will keep for seed but I want to sell a couple of carloads of the potatoes that are not so well adapted for seed purposes to get enough money to pay my summer operating costs. Most of the potatoes, however, will be kept for bedding next spring to get a supply of potato plants for the market."

I located markets for two carloads of potatoes for Mr. Fulwood for which he received a check of $1,080.00 in addition to $50 received through sale of potatoes to tourists passing his field on the way to Florida. Thus he received cash at the rate of $40 per acre and in addition has over $3,000 worth of seed potatoes for his plant business next spring.

MR. FULWOOD started in as a truck farmer some 15 years ago and operated a canning factory in connection with his farm. He saw the possibilities in the production of plants for the northern farmer, a business which had been started by two gentlemen who came to this section for their health a few years previous and supplied their old neighbors with early plants. He started in the plant business and conceived the idea that it was as easy to ship a carload of plants as a part of a car and the returns would be much more in keeping with the returns some of his boyhood associates were receiving from other lines of endeavor. He felt that he could produce plants by the carload if there were markets that would buy them by the carload so he went to the canning and trucking centers in the Middle West and found the people were ready to buy in carlots. Coming back home he pitched his business on the carlot scale. Now it is no uncommon sight to see a carload of plants for Middle West farmers leave Tifton two or three times a week in the spring of the year.

Mr. Fulwood has built up a business through these methods that returns a gross revenue of $25,000 to $30,000 annually. This revenue places this business among the big business enterprises of the section.

The Corn Royalty *of the* U. S. A.

By T. R. *Johnston*
Editor, Purdue University

Peter J. Lux and son Thomas

THE name, Lux, may have a meaning all its own to the city dweller but to the farmer of the Middle West where the bulk of the nation's corn is grown, it means a corn king and corn prince—in other words growers of champion corn.

Once again the head of the Lux family of Shelbyville, Indiana, has annexed the title of corn king of America by winning the grand sweepstakes prize at the International Grain and Hay Show held each December at Chicago in connection with the International Livestock Exposition. Peter J. Lux, winner of this title in 1919 and again in 1922, and whose sons have won the junior championship four of the eight years the show has been held, including 1926, won the title again for himself. So it is "Peter J. Lux, Corn King of America for 1926," and son, "Thomas M. Lux, Corn Prince of America for 1926."

Two other brothers of Thomas, who now is but 13 years old, have won the junior honors in past years, Frank in 1920 and 1923, and Maurice in 1924. Last year, a nephew of the corn king, Victor M. Lux, won the junior honor. The father of last year's junior champion, Edward N. Lux, has won sweepstakes honors once on single ear and several times has been around the top in the ten ear class, but hasn't quite reached the top as yet. Is it any wonder the word "Lux," is synonomous with good corn, wherever men know about corn?

THE Lux family won this year on Johnson County White corn, which was somewhat smaller in size than has won in previous shows and perhaps a bit smoother, indicating the tendency the last few years to get away from corn too large or too rough. The 10 ears shown by Mr. Lux were exceptionally uni-

(*Turn to page 57*)

TEN YEARS of

By L. S. Richardson

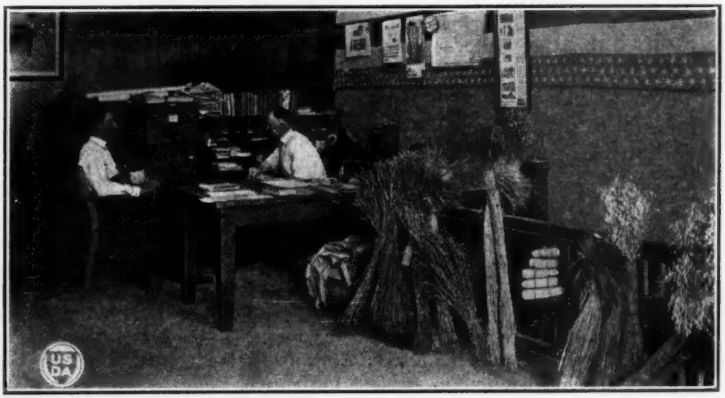
United States Department of Agriculture

TEN years of cooperative extension work under the Smith-Lever Act have given the great army of county agents, extension directors and supervisors some "sightin' in" shots upon which to base decisions affecting future conduct of their work. They are now waiting for signals from the target to tell them "how" they have been hitting the mark.

The Office of Cooperative Extension Work has recently taken a look at the target. The hits, the misses, the ricochets, and the near hits, have been recorded. The information is about to be flashed to the men on the firing line. It will prove valuable to them in helping them to correct past errors of judgment, give them courage to enter the coming years of rapid-firing in the extension field.

But let's leave the analogy and get down to plain talk. A field study was recently made in cooperation with the State extension forces of Iowa, New York, Colorado, and California. The findings throw considerable light upon the concrete problems concerning which extension leaders and workers have long desired reliable information. Some questions can now be answered with facts instead of mere opinion.

Before extension work can be of any value to the people it must reach them effectively. Naturally the first question then which concerns the minds of those engaged in the service is whether or not their teachings are reaching the mark. Of the 3,954 farms in this study located within the range of the extension guns, 2,112, or 74



Five per cent of the practices adopted were traced to the influence of office calls

"SIGHTIN' *in* SHOTS"

¶ Some interesting information about extension work

per cent, showed signs of having been effectively hit.

Each farm or farm home had adopted one or more of the new and better practices taught by the extension workers. Altogether, they adopted 9,833 changes, an average of 3.4 new practices on each farm. To have put into use an average of 3.4 better methods on each farm is a tribute to the effectiveness of extension work, and a definite measure of results. If the results obtained in the seven counties in these four states are indicative of the extent to which the service has reached the whole country, it is safe to say that extension work is really reaching large numbers of rural people.

Time seems to be an influential factor in getting results from extension teaching. The highest percentage of farms and farm homes reached was 88, and that was in a county where organized extension work had been carried on for 12 years. The lowest percentage was 60, and that in a county which had cooperated with the State agricultural college and the Federal Department of Agriculture but six years.

PERHAPS of more interest to the extension worker than any other information brought out by the study is that which gives him an idea of the best way to present his stuff to get it across. Such information has always been very difficult to obtain. A farmer or a home maker may adopt a new practice because of a number of

(*Turn to page 56*)

The county agent was mentioned as influencing 55 per cent of all the practices adopted

New Potash Facts

By W. H. Ebling

University of Wisconsin

OUT of the many soil types found in Central Wisconsin the two which have been most experimented upon are the sand and peat areas represented by the Hancock and Coddington Branch Stations.

Work on the sandy soils at Hancock has been in progress for a number of years.

The culture of alfalfa and other leguminous crops on the sandy soils of Wisconsin, has been a matter of study for a long time. Experimental work during the last six years has shown clearly that if it is properly handled this crop can be grown successfully even on these very sandy soils.

An old field which was limed in 1917 and sown to alfalfa in 1920 has produced good crops of alfalfa as well as yielded much information on cultural methods. Fertilizer tests have shown that potash is important on this type of soil. Consistent increases in yield were obtained by added applications of this material.

Where 600 pounds of acid phosphate and no potash were used the yield of hay was only 1,490 pounds per acre. Where an addition of 100 pounds of potash was made to the acid phosphate the yield was increased to 2,070 pounds per acre and an additional 100 pounds of potash brought it up to 2,305 pounds of hay per acre. It was found that gradual increases in the yield were maintained as the potash fertilizer was increased.

When 600 pounds of potash were applied in addition to 600 pounds of acid phosphate, 2,825 pounds of fine alfalfa hay per acre were obtained on this sandy soil which is ordinarily considered as being very low in value.

Continued experimental work shows more and more the importance of potash fertilizer with certain truck crops on the peat soils of Wisconsin. Work done at the Coddington Branch Experiment Station during the past few years has shown clearly that surprisingly good results are obtained by the use of potash fertilizers on this type of soil.

IN 1926 striking crop increases were obtained on the fields where large applications of potash were applied. Four hundred pounds of this fertilizer in the muriate form produced 312 bushels of Early Ohio potatoes per acre when half of the fertilizer was broadcast and half of it used in the rows. Previously the average production for three years was 150 bushels per acre. When 400 pounds of this fertilizer were broadcast a yield of 250 bushels per acre was ob-

(*Turn to page* 58)

One set of test bales went through this weather

Weatherbeaten Cotton

By C. E. Trout

United States Department of Agriculture

COTTON planters can, by a little labor and with practically no expense, stop a loss which is estimated to be big enough to average from two to five dollars for every bale of cotton grown. This loss comes from "weather damage" caused by too much moisture in the cotton. While part of the damage is the result of baling damp cotton, most of it comes from leaving the bales out in the open where they absorb water.

Baled cotton will take up a large amount of moisture if left out in the rain and dew and especially if it is in contact with the wet ground or a platform, tests made by the United States Department of Agriculture have proved. In making these tests, bales of cotton were kept for several months under exposed conditions and weighed every few days to see how much water each one took up in different kinds of weather. Trials were made for several years and at five representative places in the cotton belt.

When a bale of cotton is left flat on its side on the ground, it absorbs moisture very rapidly, according to R. L. Nixon who had charge of the tests. Practically all the damage was on the side of the bale next to the ground. This part had no chance to dry out and so the cotton suffered. Of course he found that a good warehouse is the best place for cotton. If this is out of the question, Nixon says that any dry place out of the weather is good.

If the cotton has to be left out in the open, the best thing to do is

to put the bale on poles which will keep it off the ground and cover it with a tarpaulin. As a last resort, when the cotton can't be handled any other way, set the bale edge up on poles to keep it off the ground, and then turn it at least once a week. Bales handled this way lost less than four per cent of their weight, on the average, while those on their side and not turned lost more than half.

Two tests were made at Raleigh and one at Dunn, North Carolina; one at Jefferson, Georgia; one at Little Rock, Arkansas; and one at Dallas, Texas. Seven bales were used in each test. One bale was stored in a warehouse under good conditions and the other six left out in the weather. For convenience the bales were numbered the same in all six trials. Bale No. 1 was stored in a warehouse. Bale No. 2 was left out, but was put on poles, edge up and turned after each rain or once a week. Bale No. 3 was put on poles and covered with a tarpaulin, and left alone. No. 4 was left flat on its side on the ground, the same surface down all the time. No. 5 was stood on end on the ground and not turned. No. 6 was left on edge on the ground, the same side down all the time. Bale No. 7 was kept on edge on the ground, but was turned after each rain or once a week.

THE bales were left out from November to June in two of the tests; from January to August in two others; from December to August in one and from December to July in one. At the end of the time, the bales were taken to a warehouse and opened. After they had dried out, the damaged cotton was removed or "picked" as a part of the reconditioning process in much the same way that cotton is reconditioned commercially. After the damaged cotton had been taken out, the good cotton was weighed to show how much each bale had lost during the time.

The weights show that the unprotected bales left with the flat side on the ground without turning had lost, as the average for the six tests, 273.5 pounds per bale, or more than half their original weight. The bales placed on poles and protected by a canvass cover lost 10 pounds per bale, or two per cent. The losses also make it clear that, where no protection is avail-

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A typical small town cotton yard. Who stands the loss?

N. C. Investigates Corn Root Rot

By C. A. Whittle

Editor, Southern Soil Improvement Committee, National Fertilizer Association

FURTHER evidence that corn root rot can be prevented by potash has been developed by the North Carolina Experiment Station. Dr. L. G. Willis, chemist of the station has recently put out a statement in which he gives potash credit as a preventative of root rot in that state. Similar findings have been previously reported from Indiana.

The primary cause of the root rot, Dr. Willis states, is a micro-organism of the soil. Suitable conditions for the organism to do its work are brought about by soluble iron compounds entering the plant tissue in excessive amount. Corn plants, it seem, are in no great need of an iron tonic, in fact, a little too much iron gives the plant pip rather than pep.

The run-down feeling that follows an excessive draught of iron, gives certain soil fungi and bacteria the chance they are seeking, with the result that they spread rot and ruin.

But when potash is available in the soil, according to chemists, it furnishes the plant with abundant materials for root growth and health.

Dr. Willis says: "Root rot is due directly to the action of a plant disease organism, but susceptibility to the disease is increased by the poisonous effects of soluble iron compounds absorbed from the soil. Soils deficient in potash, as are most of the sandy types included in the Coastal Plain, seem to furnish conditions most favorable for the absorption of iron and consequently for the development of root rot."

It is probable that potash does more than protect by holding back iron in order to cause plants to resist disease. Potash is recognized as the real plant tonic, giving health and vigor; and it is claimed by some that potash adds strength to the fibre by making cellulose material more rigid. At any rate a plant with health is more resistant to disease than a puny plant.

Therefore, potash should be good not only for iron sickness but for other plant ailments also. It is known that potash is a specific cure for rust of cotton, alfalfa, soy beans, and other legumes. There also is some evidence indicating that potash controls wilt of cotton but more investigation is desired to make this certain.

The recent work of Dr. G. N. Hoffer of Indiana supported by the work of Dr. Willis is bringing potash to the front in a new role, especially in connection with corn. It is evident that the value of potash is not confined to direct influence on plant growth and yields, but it is to be valued as a quarantine officer of the soil. By preventing disease it may be credited with making a large crop possible where otherwise there may have been a small crop or no crop at all.

Fertilizers *in* Oklahoma

By *Glen W. McKemie*

Oklahoma City, Okla.

¶ *A new problem being well tackled*

IT IS sometimes hard to understand just why a majority of the farmers in this fair land of ours expect the soil that they till to last forever. They do not expect their mowers, rakes, plows, binders, autos, or lighting systems to last indefinitely. They only expect them to be good for just so many years or seasons of service. And as a general rule these implements and conveniences receive good care in order that their life may be prolonged as many years as possible. Yet, the soil, the most essential factor in the farmer's life is expected to go on producing year after year with little or no care or attention.

Especially is this true of new lands. The average farmer just seems to expect the soil to produce the same abundant crops year after year. It is a sort of deep-seated, erroneous idea in the mind that the virgin soil has no life limit.

When the soil gradually begins to produce less year after year the condition is sometimes laid to the weather. The condition of the soil can always be remedied—but the man who can make the weather suit his needs is yet to be born. So, why pass the buck to the weather man?

Such are the conditions in some sections of Oklahoma. And taken as a whole Oklahoma is no different from many other states in this respect. About the only difference is that Oklahoma is just about one-half or one-third as old as the other states.

Oklahoma is no doubt looked upon today by many as being a wild and woolly western state infested with Indians, cowboys, wild cattle, oil wells, and rattlesnakes. It is true that all of these make their home in Oklahoma to a certain extent. But on the other hand some of the richest lands to be found anywhere lies within its boundaries.

There are spots in Oklahoma which, if advertised by double spreads in national magazines, would make the California and Florida orange lands seem like a wilderness. And these rich lands like the garden spots in many other states are being drained dry of those all important plant foods so essential to the growth of vegetation. Like the deserts of California and the swamps of Florida, Oklahoma has some spots that would hardly support a field mouse on a diet.

After years of preaching, education, and missionary work by farm papers, agricultural extension

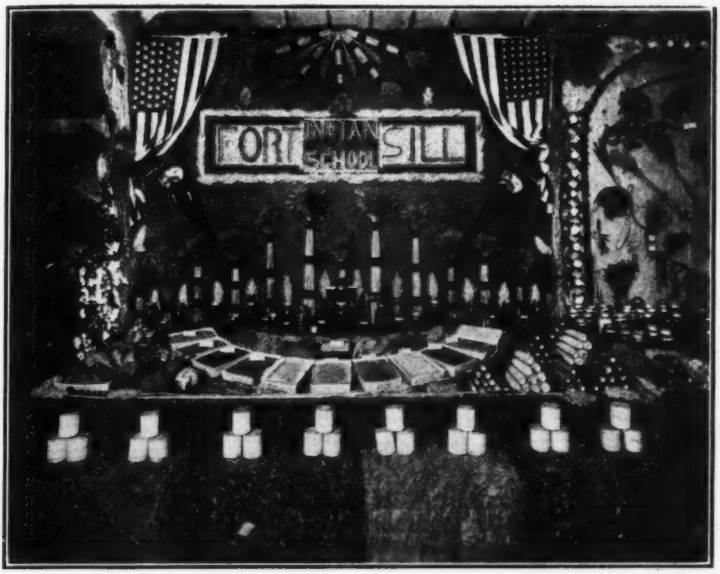

Exhibit of the Fort Sill Indian School at the Oklahoma State Fair

workers, and fertilizer companies, some headway is being made with fertilizers in many sections of Oklahoma. People are at least beginning to listen to what these disciples of modern agriculture are talking about. Especially is this true among the business men in towns that are supported largely by the surrounding farm land.

Nearly all realize that a day will come when it will be necessary to use commercial fertilizers—but somehow or other many still think that the day is far off. The farmers as a class have not been awakened to the fact that the plant food in the soil that they work will not last always. If every farmer could see the total available plant food in his soil and could then see the amount removed by every crop, one could rest assured that he would do something to retain as much of it as possible.

Another reason perhaps why the farmers in Oklahoma have not given more thought to the conservation of the plant food and the upbuilding of the soil is that so many farms have been ruined by oil wells. Of course every farm cannot boast of its oil well, but on the other hand when oil is being produced in some 40 of the 77 counties, it is enough to cause the farm owner to sit up and take notice.

However, all land in Oklahoma is not blessed with oil sands. Much of it as in other states must always be farmed and needs fertilizers before crops can be grown with any degree of success.

THIS year was perhaps Oklahoma's banner year in fertilizer work. In some sections, especially the eastern and southeastern, fertilizers have been used for a number of years and more are being used on an extensive scale every year. These communities that have been using fertilizers for a number of years are finding that they pay when used intelligently.

At present there are fertilizer experiments and tests being conducted on many types of soil common to Oklahoma in practically every county of the state. However, the bulk of the work is being done in the eastern and southeastern part of the state where it is most needed. Many of the tests are being made by the A. & M. College. Some are being run by different fertilizer companies, others are being sponsored by civic clubs, business men and chambers of commerce, while others are being carried on by individual farmers who have an experimental turn of mind.

Up to about a year ago the college had not done a great deal of fertilizer work, where the entire state was used as a testing plot, but at present the college alone is conducting 45 fertilizer tests in as many counties. Most of the experimental work is being done with cotton which is the leading staple crop of Oklahoma.

A very interesting experiment is being conducted by the Kiwanis club of Haskell, Oklahoma. This organization composed of the leading business men of Haskell realized that a start must be made to conserve the plant foods on the farms in that community. As a result they purchased a carload of fertilizer which was used on 12 farms around Haskell. This experiment was watched with much interest by the community and it is hoped that it will be an eye opener to neighboring farmers.

Two tests which proved of great interest and promise to be of much help and value to the farmers of eastern Oklahoma are those conducted by Earl Smith, county agent for Muskogee county, Oklahoma. These tests were made with cotton on two different farms, and early results in favor of fertilizers were seen in the size of the growth of the plants.

In Le Flore county, eastern Oklahoma, alone some 40 cars of fertilizer were used this year most of which were applied to cotton and corn, with potatoes and other vegetable crops receiving small amounts. A great many of the farmers in Le Flore county have passed the stage of experimental work and are now using fertilizers the same as they use their plows and cultivators.

The popular mixture in eastern Oklahoma seems to be the 12-4-4 combination, that is on the average soil. About 200 pounds per

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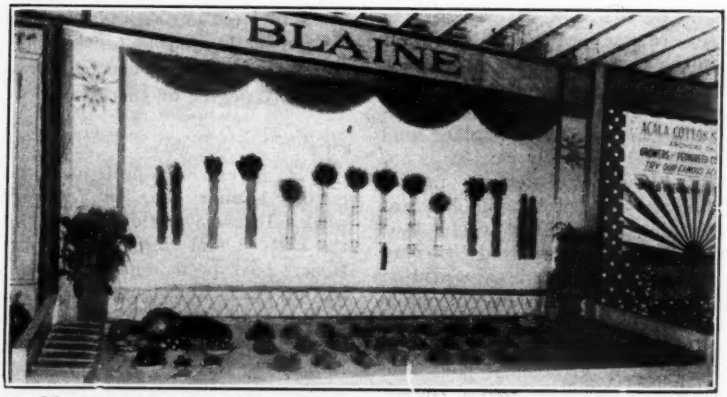

Showing the diversity of crops grown in one Oklahoma county

Once good land now gone beyond repair through neglect

From the Fields *to the* Sea

By P. M. Farmer

SCIENTISTS have made various estimates of the loss the country suffers from soil erosion. The figures differ greatly as is to be expected when areas are so large and conditions of such nature that they cannot be measured with accuracy. In addition, the bases have been different. But all agree that the loss is something staggering, whether it is figured in tons of raw soil material or in fertilizing constituents.

H. H. Bennett, of the Bureau of Soils, U. S. Department of Agriculture, on the basis of previous estimates that 1,500,000,000 tons of soil material are washed from the fields every year, says that at least 126 billion pounds of plant food are taken away in this manner every 12 months. He figures there is 4.2 per cent of plant food in the average soil.

Mr. Bennett says that figures often quoted to the effect that so many inches of top soil are removed from the country in so many centuries are dangerous in that they blind us to the great losses that occur in certain localities where water is destroying farms at an astounding rate. He calls attention to investigations by the Missouri Experiment Station which showed that seven inches of top soil were removed from a corn field given ordinary cultivation on a slope of Putnam silt loam in 24 years, whereas 3,547 years would be required to take off the same amount from a similar field seeded to blue grass.

"Information about erosion,"

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¶ *What will be the program of*

Fertilizing 1927

By G. J. *Callister*

THE big lever that moves the total fertilizer consumption up or down is not the fertilizer price. It is the values per acre of only two crops, cotton and tobacco.

Values per acre of a few crops are more active than anything else in influencing fertilizer tonnage. That such consumption has moved up and down in a very striking manner is shown by the fact that there was first a period of practically constant increase, which was followed by a period of no increase with large annual fluctuations.

These two distinct periods are shown in chart No. 1. Notice the generally upward trend of fertilizer consumption until 1914. Then observe the "ups" and "downs" following 1914 until the present time. What were the causes of this increase and fluctuation? Do such causes still influence consumption? What is the outlook for the future?

These are practical questions. The more definitely we know what the factors are and how much they influence consumption, the more definite and productive will be any effort spent in increasing such consumption.

These problems have been studied from different viewpoints by E. E. Vial, department of agricultural economics, Cornell University, and Lawrence Myers, department of agricultural economics, University of Minnesota. Both workers have recently published brief reports* covering some of the phases of their investigations. Their findings are reviewed in this article and form the basis of a brief discussion for increasing fertilizer consumption in 1927.

Their findings are not merely opinions. They are the results of a careful analysis of all the series of data available. These results have, therefore, the status of established facts, so far as any data available can give it.

It is always best to face facts. But it is better still to face related facts. We then get a more complete picture and know whether we are tinkering with a shingle on the roof while the foundation is going to pieces or not.

Knowing the relative effect of the factors that influence fertilizer consumption, and to what extent,

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* *"Changes in the Tonnage of Fertilizer Sold in the United States" and "Changes in Seasonal sales of Fertilizer Tax Tags in South Carolina:" E. E. Vial, "Farm Economics" December,* 1926, *Dept. of Agricultural Economics, N. Y. State College of Agriculture, Cornell University, Ithaca, N. Y.*

* *"Fertilizer Consumption and Cotton Prices:" Lawrence Myers, Dept. of Agricultural Economics, University of Minnesota, St. Paul, Minn. Paper read at the second annual southern convention, National Fertilizer Association, Atlanta, Georgia, November* 10, 1926.

is as important as knowing what they are. Which factor is more important than another, therefore, has been determined. This is one of the chief purposes of this work. We are indebted to these workers for a much clearer conception of what it is that influences the fertilizer consumption in the United States.

Of outstanding importance both workers have shown conclusively, that the tonnage sold is decided by very few and definite factors. Of these few exerting the most influence are the values per acre of a few farm crops.

For instance, Vial found that the combined effect of the values* per acre of only four crops—cotton, tobacco, corn, and potatoes—and the fertilizer tonnage sold for the two years previous, account for 73 per cent of the factors affecting the total tonnage of fertilizers sold in the United States. Of these four crops the value per acre of cotton alone accounts for about 59 per cent of the factors influencing the total tonnage sold in the U. S. A. The values per acre of only two crops, cotton and tobacco, represent more than 60 per cent of the factors affecting such tonnage. The values of corn and potatoes have a much smaller effect; the value of truck crops has not yet been determined.

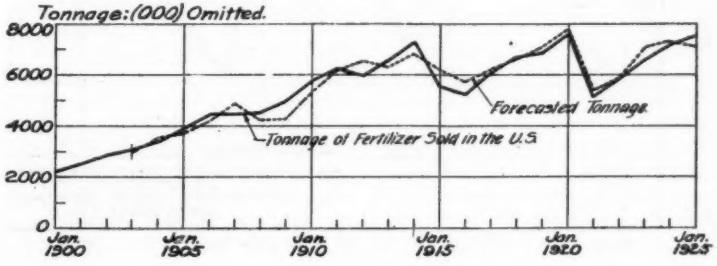
Total tonnage is, therefore, highly dependent on a very few values per acre which are largely outside any influence or control. The conclusion follows that under present conditions of fertilizer usage, it is a relatively difficult matter to increase the tonnage sold.

Again the same thing was found to hold in an analysis to determine which factors influence the consumption of fertilizer on cotton. The price of the cotton and the yield—together with the value per acre—were found by Myers in his investigation to be of the most importance. He found that only six factors account for all the major and many of the minor variations in the consumption of fertilizer on cotton. Of these six the fertilizer price was the least important. For this study the data used were the prices of materials from 1897 to date.

Myers gives some very interesting information on these prices. He says "taken by themselves, they are low enough to cause a large consumption. . . . . It should be pointed out, however, that fertilizer price is not the only or the most important factor in determining consumption . . . cotton price is the most important factor."

Myers pointed out the importance of considering fertilizer prices in relation to the average

* *The value of various crops was deflated by using the year index of wholesale prices of the United States Bureau of Labor Statistics. The index of each year was expressed as a per cent of the preceding year.*



of all prices. The dollar is not a satisfactory instrument of measurement over the series of years. Fertilizer prices in terms of purchasing power were obtained by dividing the index of actual fertilizer prices by the index of wholesale prices of all commodities. This deflated index shows that, with the exception of the war period, the trend of fertilizer prices has been downward since 1897. From 1922 to the present they have stood at roughly 70 per cent of their 1913 level.

As already pointed out, while low enough to stimulate large consumption, the cotton price and yield are much more important. Relative agricultural prices and cotton acreage have less influence.

From these two investigations it can be concluded that the great lever that does more to raise or lower tonnage sold than anything else is the values per acre of only four crops. Until 1914 the increased tonnage shown in the chart was sold on a rising tide of these crop values. They are the big salesmen. Under present conditions when these four crop values go down, tonnage goes with them.

These average crop values are so definite and constant in their effect on the tonnage sold that they can be used to predict the consumption during the following year with a fair degree of accuracy. Using all the factors described, both Myers and Vial have developed methods for forecasting tonnage, the former for the consumption on cotton by states, the latter for total fertilizer consumption for the United States as a whole. They are shown in charts 1 and 2.

These methods have been tested against the tonnage actually sold. The estimated and forecast consumption were compared and it was found that a fairly accurate forecast could be made. The limitations and uses of such forecasts are carefully explained. It is intended that they be used as an aid to judgment and not to replace it.

Based on these forecasts the outlook for 1927 is better than perhaps many people think. Vial gives the estimate for total consumption as 86 per cent to 94 per cent of the 1926 total tonnage. He shows that the factors sustaining his estimate are the values

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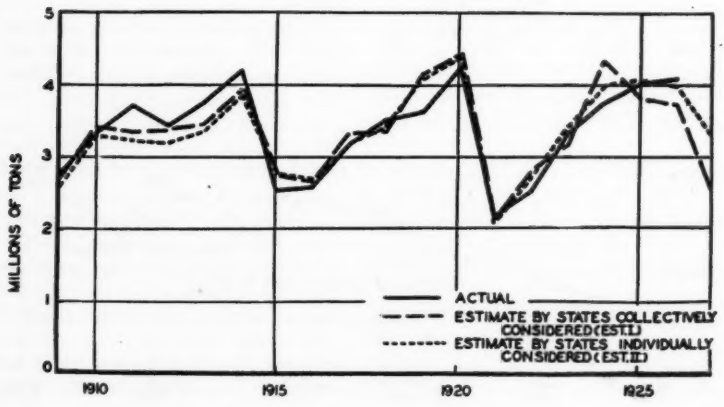
ACTUAL AND ESTIMATED FERTILIZER CONSUMPTION FOR EIGHT COTTON STATES 1909-1927



AUCTIONS

By S. D. Gray

¶ *A word in their defense*

AN auction is nothing more or less than a meeting at which people are invited to compete for the purchase of articles, the principle being one of successive advancing of price to be paid.

There are many advantages of auctions. They have fitted almost every conceivable commodity from the surplus of beautiful maidens in the Babylonian days to disposing of wares, household furniture, animals, crops, parcels of land in the present day. Obviously the antiquity of the auction principle and the fact that it is employed even to a larger extent today and for a greater variety of purposes, justifies its existence.

Does the auction always accomplish its purpose? Does it always result in advancing the cause for which it is used? Certainly not!

IN the present age, we have two distinct types of auctions; first, the kind that applies to individuals in the estate settlement and bankruptcy proceedings and second, the kind that applies to cooperative enterprises. It is the purpose of this article to discuss the subject of auctions and auctioneers with special regard to their value to agriculture.

Extensive and rapid development of agriculture, with its many crop and stock problems, has necessitated the consolidation of like interests in various communities into cooperative organizations, suited to the needs of these interests. The organization may be one for cooperative buying of products to be used on the farm, or for the marketing of farm products to best advantage, or both. At best in the functioning of any such organization the auction principle is extensively employed.

IN the agricultural field the early history of auctioning to dispose of surplus stock or crops shows that it has not been for the best interest of the farmer. The purpose they did serve however was to point out the necessity for community auctions to replace the infant auction, the individual.

Today we see auctions widely advertised in press dispatches, magazines, and newspapers, of such successful enterprises as purebred livestock associations, apple-marketing associations, purebred grains, and associations for crops like onions, strawberries, prunes, grapes, oranges, potatoes, cotton and tobacco.

The big stumbling block to the successful cooperative auction has been the absence of a definite standard for arriving at the real value of any given product. To a certain extent this has been overcome in the case of pedigreed grains and stock, but in other staples like fruits, potatoes, cotton and tobacco, where quality is very important the standards for judg-

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Nebraska

By *Emil G. Glaser*
Lincoln, Nebraska

¶ *No. 9 of this series*

ABOUT 1871, the same year Mrs. O'Leary's cow kicked over the lantern and burned Chicago, and the same year the University of Nebraska received its first students, a great prairie fire swept over Nebraska's desert of grass. It had been a year of extreme drouth, and the grass was dry as tinder. It was late in fall when the great conflagration broke out painting the skies an ugly red for days and nights.

It cost many human lives, wiped away homes of hundreds of settlers, and destroyed much livestock. It is well remembered by witnesses how the fury of the flames jumped the waters of two rivers, each 150 feet wide, over eight rods of plowed fire guards, and stopped only when there was nothing more to burn.

Other fires rode over Nebraska's prairie on the wings of the wind. But today, where once they raged, there grow fields of corn, alfalfa, wheat, oats, sugar beets, potatoes and orchards of fruit trees—which unlike the grasses furnish food for man instead of food for prairie fires. It took real men and women to face the dangers of the early Nebraska prairie. But they dared to face the seemingly insurmountable odds—and they conquered.

Gradually, yet surely, acre after acre of prairie was turned over. New crops were tried by the pioneers. The crops thrived—and after years of hardships the settlers began to prosper. Improvement of crops and farm began to occupy their minds. And so, there came forth, because a need began to manifest itself, experimental work under the guiding hand of the state. The experimental projects prospered. Out of this came forth a greater Nebraska agriculture, and the Agricultural College with its experiment station and substations—all in the span of about 50 years.

AT Nebraska the College of Agriculture is one of the 10 colleges of the University of Nebraska. It has its own campus, however, in the outskirts of the city of Lincoln, with 10 main buildings, including the finest agricultural engineering building in the world, an outstanding dairy building, and probably the best equipped animal pathology plants in the Mississippi Valley. The farm at the main campus comprises about 320 acres, supplemented by another farm a few miles distant.

A regular college course of instruction is given and also a course of high school grade in a School of Agriculture. The College of Agriculture is also responsible for the Nebraska School of Agriculture at Curtis, and for experimental substations at North

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Better Crops' ART GALLERY *of the month*

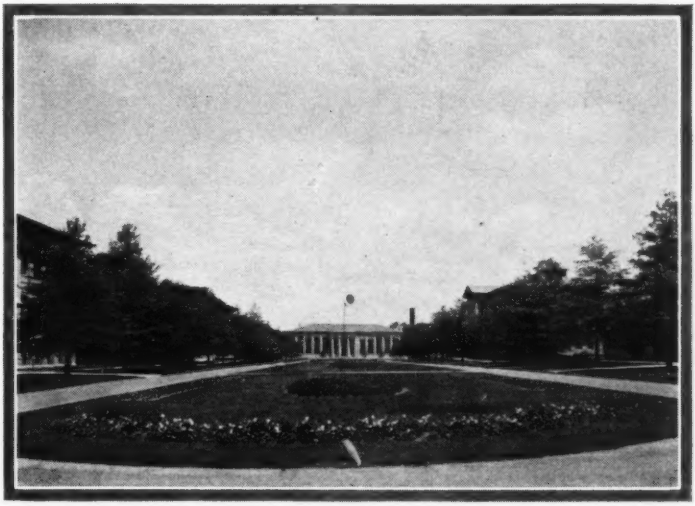
E. A. BURNETT

dean of the College of Agriculture and director of the experiment station, University of Nebraska has been associated with the institution for more than a quarter of a century.

A campus view, College of Agriculture, University of Nebraska. Trees and flowers are now common on this once treeless prairie.

Agricultural Engineering Building, University of Nebraska, regarded as the finest structure of its kind in the country.

The Plant Industry Building at the University of Nebraska. The founder of Arbor Day was an early settler of Nebraska.



Thoughtful landscaping has been employed to make attractive the campus, College of Agriculture, University of Nebraska.

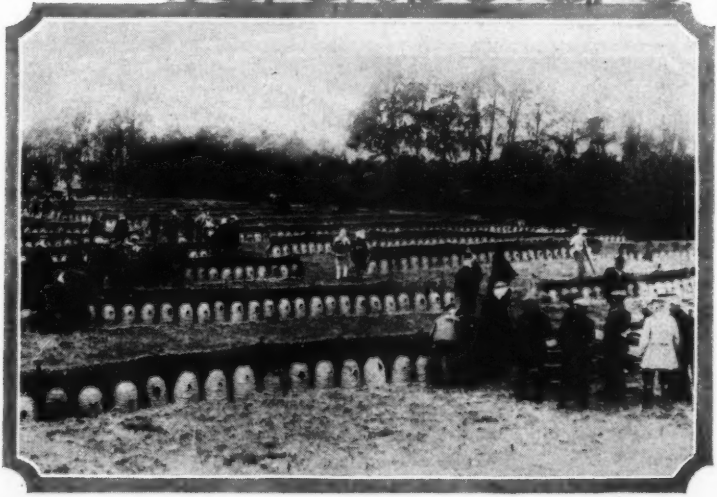
Farming in

Picking hops in northern France. Besides giving beer its bitter flavor, hops are often used medicinally. Pillows stuffed with hops are used to induce sleep.

Among the curious sights in agriculture is this aerial view of the pineapple fields of the West Indies. The fields are spread with paper to protect the fruit from the sun's rays.

n other Lands~

This buxom "Maud Muller" is a Russian peasant girl who evidently does not find the lack of modern farm implements anything to frown about.



The only public bee market in the world is held annually in the village of Veenendaal, Netherlands. More than five billion bees were sold or traded at this year's market.

The livestock judging team from the Oklahoma A. and M. College which won first place in the intercollegiate contest at the recent International Livestock Exposition at Chicago, and the grand champion steer over all breeds, Rupert B, developed and exhibited by the Oklahoma A. and M. College at the same show.

Kenneth Hinshaw, 20-year-old farm boy of Goldendale, Washington, awarded the Moses Leadership Trophy at the recent International for his outstanding 4-H Club work.

The Indiana fertilizer exhibit at the International Hay and Grain Show held in Chicago in connection with the International Livestock Exposition.

The Editors Talk

"It is a man's handicaps that make him, not his successes."

THE world has produced more cotton every year since 1921. This year's world total will be almost twice as large as the 15 million bales produced 5 years ago. Consumption has increased by only 25 per cent. World production has run ahead of world consumption.

TAKE THE BURDEN OFF COTTON

The crash came. A drastic price decline in the cotton belt took place. The cash farm income during the coming spring, it is estimated in some sections, will be only 65 per cent of last year's farm cash income. The immediate outlook for business in many sections is poor.

That is the gloomy side of the picture. Enough to make a pessimist's heart glad!

But we believe in another side. We believe that in spite of over-production, low prices, and all the gloomy figures, the present over-production is a blessing in but thin disguise.

Why? Because it will bring the South together as one man to achieve as they have never achieved before—more than any leader could ever have done. As a good southern friend told us the other day: "It is a man's handicaps that make him, not his successes". The handicap of over-production last year will build a new South.

Among other things that will be accomplished are crop diversification and cheaper production of cotton. Much of the burden will be taken off cotton. Ninety per cent of the farmer's income in some states is derived solely from cotton. Sixty per cent of the fertilizers consumed in the United States is used in the cotton belt—the largest part of it on cotton. The great problem the South is going to solve is to take this burden off the cotton crop—to diversify—to produce cheaper cotton—to spread the use of fertilizers over a more diversified crop area.

It is a man's program. There are plenty of objections. There are plenty of people who point out the difficulties. They say for instance, that new crops will have to be grown which will

require new capital to finance them, new sales methods, and new markets, which cannot be organized overnight.

Others show that a shift to other crops, especially tobacco, which has brought good prices, will cause over-production and a break in prices for this crop as bad as the break in cotton.

Others again point out that one-fourth the cotton is grown on large plantations. Because the landlord must have a cash product, very little reduction can take place on this one-fourth of the cotton area. Forty per cent of the cotton is produced by free renters. Here again the landlord is compelled to require a cash crop.

The remaining thirty-five per cent is produced by owner-operated farms. Diversification is already practiced under this system and much reduction could not take place. These are just a few of the reasons which show the difficulty of the program.

But there are answers to all these objections. The South knows the answers better than anybody else. They tell us that cash incomes do not depend on a big acreage. The smaller acreage properly worked will give the landlord just as big a cash income, and that is more important because of the lower cost of production, a bigger profit. Fertilizers play an important part in this phase of the program. There is a danger, it is true, of demoralizing the market if a shift is made to such crops as tobacco.

It is likely that more interest will be taken in the crops already grown and consumed in the South. There is, for instance, at present a bigger acreage of corn than of cotton. A larger yield of corn could undoubtedly be used. The shift will be made to corn and feed crops. The dairy, truck, and fruit industries will be developed more. Much of the fertilizer consumed could be used on these crops. It is in developing such fields as these that the South will take the burden off cotton. The fertilizer industry through its various agencies in the South is assisting in the program. It should be one of its leading projects.

The objections and difficulties cited show that there are real problems in taking the burden off cotton. Any remedy to be effective must be based on a clear understanding of these problems and a full appreciation for cooperation in solving them. To get these a dynamic stimulus is needed. We believe this stimulus has come. Big business is taking more interest in the farmer. The farmer is beginning to understand finance—the banker to understand the farmer. A large view and a long view is being developed.

The balance again adjusted, the South by the aid of her own resources, will emerge from this period of over-production with a renewed spirit and a greater stability in the financial and agricultural fields.

We are indebted to our good friend from the South for a stimulating viewpoint. We are glad to pass it on.

WE all dissent. The difference is how we do it and why we do it. But this is often the difference between success and failure. It is vastly more important than it was in grandfather's day.

DISSENTERS

The trend of the times is towards cooperative effort—mass action as well as mass production—to work together for a common aim. The day of individualism is passing. The emphasis is on the program, the ideal, the common purpose—not on any one man.

If we dissent too much for too little reason we become a "voice in the wilderness." If we hold no opinions we are buffeted, mentally and physically.

In our attitude towards the problem we cannot adopt better advice than Ruskin gave, "make our beliefs or disbeliefs definite." There is no one who adds to the troubles of the world so much as a dissenter who does not know his own mind—who has a different idea every day. After that the old-fashioned virtues of sincerity, tolerance and patience are increasing in value every day.

Pick out a successful man in business, in the professions or in agriculture. Notice how and why he dissents—study him—follow him. It will pay. More than that we shall be of more value in the world.

A successful agriculture today needs in politics, business and on the farm, as badly as it ever did need, ***constructive dissenters.***

STOP! Look! and Listen!—Mr. Tobacco Grower—There is danger ahead of you.

1927 TOBACCO OUTLOOK

During the past 12 months there have been many changes in the tobacco situation, the most conspicuous being the improvement in prices throughout the country, except in the dark tobacco region.

Prices paid for tobacco almost everywhere are based on quality and the general appearance of the leaf on the warehouse floor. Appearance means half the battle with many products, and tobacco is no exception to this rule.

While reports, received from personal observations in some of the important tobacco markets, indicate that quality is the most important factor, it is evident that the best prices for quality leaf are only received where proper attention has been given to sorting and grading.

The 1926 crop has been good in quality in most regions and the acreage has been somewhat less than in the two previous years. The smaller supply and the better average quality have made the past year's prices quite satisfactory over most of the country.

Considerable gloom obtains in the dark tobacco region centered in Virginia. Because of a decline in the use of this tobacco, the principal use of which has been for chewing and for snuff, growers and manufacturers are quite distressed. Prices for some of the best tobacco in this region, right in the height of the season, have averaged less than 10 cents per pound, about 5 cents less than the cost of production. The present situation in this region should result in a greater diversification of crops and eventually to greatly improved condition for these farmers.

The greatest danger for 1927 lies in the possible increase in acreage, stimulated by the good prices of 1926.

In the South where cotton has gone flat, the danger of increasing the tobacco acreage is greatest. The present acreage is about all the market can stand. Any increase will result in lower prices.

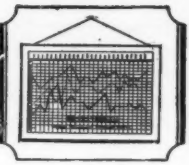
In the North farmers realize that the cigar industry has had a hard pull. Farmers have suffered along with the industry, but they have learned a lesson. The industry is well organized here and farmers are working more harmoniously than ever before to avoid over-production.

Looking back at conditions in the tobacco industry during the past five years and realizing the come-back it has made under most adverse conditions by acreage reduction, attention to quality production by proper use of fertilizers and cooperative marketing, the best slogan we can suggest is: "Keep Kool and be Kautious."

In short—Don't increase your acreage. Fertilize for better quality and bigger yields. Give more attention to housing and curing. Grade your leaf for appearance sake.

Let's Try It—Yours for Success.

AGRICULTURAL DEVELOPMENTS



By P. M. Farmer

What Soil Analysis Tells

Many farmers have come to the conclusion that the soil chemist can make an analysis of the soil and from his data tell just what that soil needs and what crops should be grown on it. Speaking on this subject recently, Dr. L. H. Smith, soils authority at the University of Illinois, put the proposition in the pecan shell:

"It is true that in many cases an analysis of the soil will indicate definitely what crops should be grown and what fertilizers should be used. Take, for example, the case of a peat soil where the chemical analysis shows that the element potassium is present in very small amount. Potassium fertilizer is applied and, lo, the trick is turned. But the matter is not always as simple as this. On the other hand, there are certain soils in which this same element potassium is present in amounts totalling thousands of pounds an acre and yet the application of a few pounds of potassium fertilizer will return a good profit in increased crop yields. The ordinary analysis would fail to predict this result. It should be emphasized, however, that this a rather exceptional case, mentioned for the sake of illustrating the principle. What is said of potassium will apply to other plant food elements as well. Thus the chemical analysis alone does not necessarily indicate what should be done to improve a soil. Much depends upon the nature of the crops grown and their ability to utilize plant food material. Much also depends upon the plant food substances themselves as to their solubility."

Purnell Act Promising

"The past year has been the most conspicuous one in the expansion and development of the experiment stations since the national system was started," said E. W. Allen, Chief of the Office of Experiment Stations of the Department of Agriculture, before the meeting of the Association of Land Grant Colleges held at Washington in November. He said it was a most important year because the Purnell Act has meant more than added funds—usually an enlargement of the research field, the selection of new personnel, the setting up of projects of greater definiteness, and the fitting of the new enterprises into the general plan for the station's activity.

In his talk the work going on was outlined: A group of 690 projects had been outlined and put under way up to November 1. For the most part they are high-grade undertakings, creditable from a research standpoint while looking to practical advantage in the application of science To summarize them briefly, 96 are in home economics, 224 in argricultural economics, and 23 in rural sociology; a total of 343 in these new subjects, compared with 347 in pro-

duction lines. In the field of production the largest number of projects relate to livestock, 83, with 26 additional in dairying and 17 in veterinary science. Soils and fertilizers, field crops, pastures, and plant improvement have a total of 87; horticulture and forestry, 38; plant diseases, 39; entomology, 43; and agricultural engineering, 16.

Milk Test

"True blue" never applied to milk. Housewives used to say that if milk looked blue it wasn't worth the price—regardless of the price—and that it was all right if it possessed a distinct yellow tinge. But this color test wasn't exactly reliable. The new methylene blue test is said to have greatly reduced the guess work in milk plants and cheese factories, and the apparatus necessary cost only a few dollars. E. G. Hastings of the Wisconsin College of Agriculture reports that the test has been increasing greatly in use in Wisconsin dairy plants. He describes the test: Ten cubic centimeters of milk as received at the factory is placed in a test tube with one cubic centimeter of a solution of the methylene blue dye. The mixture is kept at a body temperature in a kettle of water heated by a lamp. In the first place the dye colors the milk, and the quality of the milk is determined by the length of time required for the color to disappear. The fewer the bacteria the longer the blue lingers. High quality milk will still show blue after 5½ hours in the bath, while very germy milk will go back to the original color in a half hour or less. One great advantage of the test is that the patron can easily follow it and is impressed with the different reactions of clean and dirty milk. It has already done much for cheese makers and milk distributors.

Give Spuds Air

Blackheart of stored potatoes has been found to be due most frequently to a lack of sufficient ventilation and sometimes to overheating, a condition liable to occur in cars. This explanation is reported by the New York State Agricultural Experiment Station where investigators have produced the typical black and brown areas in the centers of potatoes experimentally. Here's the gist of their advice: Potatoes stored at temperatures below 45 degrees F. may be piled 6 feet deep without danger to those on the bottom. If the temperature is to be 50 degrees or a little more, usual in home cellars, the pile should be no more than 3 feet deep if the tubers are to remain more than three or four weeks. The condition sometimes results in outdoor pits, although they are usually better ventilated than might be supposed. Small pits need no special provision for ventilation. In cars it pays to keep from loading too close to the heater. Blackheart potatoes are not desirable for seed, but they are not dangerous to other seed potatoes. Blackheart is a condition, not a disease.

A Good Hog Feed

In experiments at the Nebraska station cracklings, a by-product of lard rendering in the packing plants, gave better results as a protein supplement for corn in hog feeding than did tankage. On a self-fed ration of corn and cracklings pigs gained more than a half pound more per day than those on corn and tankage. It took 48 pounds less corn to produce a hundred pounds of gain in this lot. Some packing houses are now changing to the dry rendering method which yields this product, but there will never be a large supply.

Foreign and International Agriculture

The purpose of this department is to help us understand the scientific, practical, and industrial agriculture of other countries and the international developments which result. The editor believes that such knowledge is now of the greatest importance in our agricultural prosperity. Every care is taken to insure accuracy—both of facts and their interpretation.

The British Farmer and His Pasture

By *Herbert* R. *Cox*

Specialist in Farm Crops, New Jersey Agricultural Experiment Station

I SHALL never forget that first day in England as the train sped from Harwich to London. It was June and on all sides there was grass land—for hay, but still more for pasture. For years I had looked forward to this day, to see the pastures of Great Britain, and there they were, green, carrying cattle of various shades of red, both dairy and beef animals, and sheep.

To many people in America the pastures of Great Britain are thought of as being of outstanding excellence, like bulbs in Holland or vineyards in France. And as a matter of fact the pastures of the island of Britain are on the average better than our own. The reasons for this are two; one is that the climate is more favorable, being cool and moist throughout the year; the other is that many of the farmers of Britain give thought and care to their pastures, which can not be said of the farmers of the United States excepting in a few limited sections.

You will find in Great Britain, however, all sorts and conditions of pastures. At the one extreme there are certain areas such as the Midlands and the Southwest of England where many pastures may be found carrying a steer to the acre throughout the season; and at the opposite extreme there are rough mountain areas that will carry not more than one steer to seven or eight acres. I am referring here to permanent pasture, land which has been in grass for years, in some cases for centuries. There are also rotation pastures, land which grows root crops, small grains and grass, the sod being pastured for a year or more following a year or more of mowing. Also the British farmer frequently grazes his aftermath following hay harvest, and sometimes he grazes his young wheat with sheep. But he does not have our sweet clover or anything equivalent to it.

As I have already observed the British farmer has for years given thought to his pasture. One reason for this is the relatively important position which pastures occupy in the agriculture of the island. The area under grass of one kind and another in England and Wales alone exceeds 21.5 million acres, as against 9 million acres devoted to crops other than grass. In other words grass occupies 70 per cent of the area devoted to all crops.

Of the land under grass about 5.75 million acres are used for hay and 11.25 million acres for grazing, to which must be added some 4.5 million acres classed as "rough mountain and heath land used for grazing." The figures for Scotland would show about the same relationship as for England and Wales.

Realizing the importance of pastures in the agricultural economy of the kingdom the experiment station workers began years ago to study their improvement. One of the early experimenters was Sir Thomas Middleton of Armstrong Agricultural College, Newcastle, who has been succeeded by Professor Gilchrist. Other experiment stations took up the subject so that a considerable amount of information has been accumulated.

One outstanding conclusion from these experiments is that it pays to use phosphoric acid on grass land with the addition of lime under certain conditions. The effect is to bring in white clover which is not only of great value in itself but it stimulates the grasses associated with it. Basic slag, a by-product of the steel industry, furnished both phosphoric acid and lime and seems to be the favorite phosphatic material for top dressing grass. Ground phosphate rock has also given good results; it acts more slowly than slag but the effects are more lasting. Basic slag varies considerably, but a fairly good grade slag will run about 17 per cent phosphoric acid. Acid phosphate has also given good results, generally when accompanied by lime.

These experiments were run in a variety of ways and under a great variety of conditions. Some of them showed remarkable results in improving pasture land; others did not show such striking results. Nearly all of the experiments were conducted along the traditional British lines of weighing in certain lots of cattle or sheep on the various plats and weighing them out at the end of the experimental period.

As far as top dressings to grass land are concerned the following summary of British experience might be made: Excepting the most highly productive pastures and some of the very poor pastures on sand or marsh land, there remains a vast acreage of upland grass, varying from poor to fairly good, which will show profitable returns from the treatment. In many cases the carrying capacity of a pasture will be doubled. Grass will start off earlier in the spring and the growth of individual animals will be greater —sometimes more than double—on account of the higher quality of the herbage. An excellent way to start to improve a pasture is to give a liberal dose of slag to begin with, from 700 to 1000 pounds per acre, and an excellent way to maintain a pasture so improved is to repeat the slag applications at the rate of 500 pounds per acre every 3 or 4 years thereafter. In some cases it seems to pay to add lime to the phosphate treatment and in some cases potash; but in no case have nitrogenous fertilizers seemed to be warranted.

AND now we come to the second and last point which the British believe is an important factor in pasture improvement, the use of wild white clover. This is a true perennial form of ordinary white or little Dutch clover. It is considered to be more valuable than ordinary white on account of greater longevity of the plants and its greater spreading habits. It grows wild all over Great Britain, but the seed has never been collected and offered for sale until recent years. It is not generally

advisable to try to get this plant established by seeding it on permanent pastures, but it is advised by the agricultural college people that seed of wild white clover be included in mixtures for sowing down. Even in rotation pasture where the land is to be grazed but a year or two, it is advised that wild white clover be included in the mixture. Fortunately it is not necessary to sow the seed on permanent pastures, since on most pastures the plant will work in voluntarily if the soil conditions are made favorable.

Wild white clover has been tried out at several of the experiment stations in the United States, but up to date our people have not been as favorably inclined toward it as are the British. One reason perhaps is that little Dutch clover produces seed abundantly here and will establish itself permanently by reseeding, providing the soil conditions are made satisfactory.

All this enthusiasm in Great Britain about phosphate fertilizers and wild white clover for pastures is not confined to the experiment station people. These two means of pasture improvement have been adopted by many of the progressive farmers. I was told that in the Irish Free State 60,000 tons of basic slag is used a year, most of which goes on grass. Of course a much larger amount than this would be used in Great Britain. And there is such an insistent demand for seed of wild white clover that in 1925 the market price on this item was ruling around $3.00 a pound. It may be said that the seed mixtures advocated include wild white clover at the rate of from one-half to one and one-half pounds per acre.

And this brings us to the question of the other ingredients in mixtures for seeding down. This is a lengthy one and can not be treated fully here. The traditional British seed mixture consists of many ingredients in fairly large quantities. Besides the common grasses and clovers it often includes such uncommon grasses as crested dogstail and rough-stalked meadow-grass and such queer plants as chicory and yarrow. The experiment station people now believe that there is little excuse for the complex mixture, since a sod reverts within a very few years to the few species to which it is naturally adapted. A "sensible" mixture which is now recommended for quite a variety of conditions, to be mowed one year and pastured subsequently, is as follows:

Perennial rye grass.....	12 lbs.
Cocksfoot (Orchard grass)	8 lbs.
Timothy	4 lbs.
Late flowering red clover..	4 lbs.
Alsike clover	1 lb.
Wild white clover.....	1 lb.

BEFORE concluding it would be well to remark that there is an awakening interest in Europe in the question of applying nitrogenous fertilizers to pastures. The idea probably originated in Germany but it has recently spread to Britain. Some of the German experimenters claim that it pays to apply sulphate of ammonia, nitrate of soda and other sources of nitrogen to grass land. The prospect is that these materials will become cheaper in a few years, which should make their use on grass all the more justifiable. Our own Dr. White of Pennsylvania has shown that on a blue grass sod it pays to use nitrogen in addition to lime, phosphoric acid and potash. All this would seem to contradict the earlier British results on pasture fertilization. Although these early British results are undoubtedly sound, it is more than possible that changing economic conditions, such as intensification of agricultural production, higher

food prices, and lower fertilizer prices, may throw them into the discard, as far as the use of nitrogen on grass land is concerned.

EDITOR'S NOTE:—*The above is a very intimate picture of a typical phase of British agriculture. Britain is, of course, primarily a stock country. The British farmer, therefore, insists on clover to carry the cattle and as the experiments at Rothamsted have shown, the continued use of nitrogen kills out the clover. A walk over the plots in the park shows very strikingly this result of the use, especially of some forms of nitrogen. Agricultural conditions in Europe are different, especially on the plains of northern Germany. These differences might be kept in mind in studying European results and the possibility of the use of nitrogen on typical British pastures.*

Regarding phosphates, from our own observations of the plots at Cockle Park, a few miles north of Newcastle (under supervision of Armstrong Agricultural College) the soil is a very different type to that on which pastures are located in many other parts of England, as for instance, in Sussex or on the eastern plain. Some caution might, therefore, be exercised as to whether the results obtained at Cockle Park would apply to pasture conditions generally.

Many soils in England show the necessity for both phosphates and potash for maximum yields of clover. Certainly it would be well to try phosphates and potash before deciding that phosphates alone are sufficient.

Again, if there is a mat of old grass on the pasture the British farmer is particular to cut it up so that seed or fertilizers will not remain on the surface. This is important.

We are very glad to publish this article because it indicates a very close observation of problems that should be studied much more in this country.

* * *

Fertilizers in Oklahoma

(*From page 22*)

acre of this proportion is the usual amount applied to cotton and corn, and from 400 to 600 pounds on truck crops. In some cases however from 1,000 to 1,500 lbs. are used under potatoes.

An outstanding example of what fertilizers will do in eastern Oklahoma can be seen from the test on potatoes conducted by Lee Nolan of Poteau, Oklahoma, under the direction of the county agent. In brief Mr. Nolan's test is as follows: Three test plots were used in this experiment. Certified Red Bliss irish potatoes were planted at the rate of about eight bushels per acre. To plot No. 1 was applied 400 lbs. of 12-4-4 (PNK). The rate of yield from this plot was 143 bushels per acre, practically all being graded as U. S. No. 1. To plot No. 2 was applied 800 lbs. of 12-4-4, the yield being 163½ bushels per acre. Plot No. 3 received no fertilizer and the yield was a little over 40 bushels per acre.

It goes without further comment that Mr. Nolan is thoroughly converted to the use of commercial fertilizers in growing potatoes. And Mr. Nolan's test is only one among many that could be found in Le Flore county.

Much of the soil in eastern Oklahoma seems particularly well adapted to such crops as early vegetables and trucks, berries, fruits, grapes and the like. The land as a whole, on which these crops are grown, is not naturally rich and the use of commercial fertilizers is paying extra dividends where intelligently used. An increasing amount of early vegetables, grapes, and berries are being shipped to eastern and northern markets where they command a good price and this is made possible largely through the use of commercial fertilizers.

Oklahoma as a whole is just beginning to awaken to the use of commercial fertilizers. It is making a fairly good start and is perhaps as far advanced as any other state considering its age—but still there is an awful lot of land in Oklahoma that needs fertilizers of some kind.

REVIEWS

This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture and the State Experiment Stations relating to Soils, Fertilizers, Economics, Crops, Crop Diseases, and Insects. A file of this department of BETTER CROPS would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

It is of particularly practical value to know what plant nutrients and how much of each are lost under normal conditions in drainage waters. Millions of dollars are spent annually to supply soils with plant food. Millions could be saved by a more complete knowledge of soil management systems that would prevent economic losses.

Unfortunately, accurate methods of determining such losses require a long time and are expensive to maintain. Therefore, the data is not as complete as the practical importance of the subject warrants. Every encouragement should be given to further work along these lines.

The most accurate method of finding what such losses are is by the use of drain gauges, which are "water-tight vessels containing soil so arranged that the water percolating through the soil can be collected, measured, and analyzed." They are commonly called lysimeters. They are of different types. Some of the best known are located at Cornell University in this country, at Rothamsted in England, and Aberdeen in Scotland.

The outstanding results that have so far been obtained have been reviewed by J. A. Bizzell in a paper "Removal of Plant Nutrients in Drainage Waters." [Reprint from the *Journal of the American Society of Agronomy*, Vol. 18, No. 2, February, 1926.] It is shown that of outstanding importance is the loss of calcium. The quantities vary over a wide range from 300 pounds to 1,100 pounds per acre or more. Cropping seems to decrease the removal of calcium. Fertilizer treatments have pronounced effects, especially the use of nitrogenous fertilizers. This removal of calcium has, therefore, an important practical influence on the extent to which soils should be limed. The information available on the losses of potassium and magnesium is not of much economic importance.

The loss of the most expensive plant food, nitrogen, is very important. Cropping reduces such losses and in some cases prevents it entirely, though crops differ very widely in this respect. The amount of sulphur lost from the soil is comparatively large. On the other hand, very little phosphorus is removed.

These losses are of vast practical importance. They should be studied by everybody interested in the conservation of soil fertility.

Fertilizers for wheat are discussed in a very practical manner by R. M. Salter in the *Bi-Monthly Bulletin* of the Ohio Agricultural Experiment Station, September and October, 1926.

The author points out that the one opportunity to profitably in-

crease the yield of wheat lies in the more careful selection and generous use of fertilizers. The experience of practical farmers in Ohio has shown that it is possible to increase the yield very much above the average by the use of fertilizers. It has been found that the greatest return is from the use of mixed fertilizers in most counties. That is, mixtures that contain nitrogen, phosphoric acid, and potash. While phosphates are important, the other nutrients should be supplied in sufficient quantities. The use of the standard fertilizers is given.

The most complete summarization of experimental work on the effect of fertilization on quality of tobacco yet published probably is to be found in the "Report on the Agricultural Experiment Stations, 1925," just issued by U. S. D. A. This review brings up to date the outstanding experiments with tobacco and should be welcomed by investigators everywhere because of the impartial way in which the high lights of the experimental data have been assembled for ready reference. The publication contains reports on many other projects of experimental station work.

"Testing Fertilizers—Spring 1926." Agricultural Experiment Station, University of Missouri, Columbia, Mo., Cir. 149, Sept., 1926, L. D. Haigh.

"Annual Report of the Board of Control for the Fiscal Year Ending June 30, 1925." Agricultural Experiment Station, University of Nevada, Carson City, Nev.

"Inspection of Fertilizers," Agricultural Experiment Station, Rhode Island State College, Kingston, R. I., Annual Fertilizer Circular, Sept., 1926, J. B. Smith and W. L. Adams.

"Commercial Fertilizers in 1925-26 and Their Uses," Texas Agricultural Experiment Station, A. & M. College of Texas, College Station, Texas, Bul. 346, Nov., 1926, G. S. Fraps and S. E. Asbury.

Soils

"Character of the Ground-Water Resources of Arizona," Agricultural Experiment Station, University of Arizona, Tucson, Ariz., Bul. 114, Mar., 1926, C. N. Catlin.

Crops

When one considers that more than half the carlot shipments of cantaloupes for the whole United States originates in California, the general interest in a new circular, "Cantaloupe Production in California," is recognized. The publication bears the number 308 and was prepared by J. T. Rosa and E. L. Garthwaite to give general suggestion on the culture and handling of the crop for growers who lack experience. While the conditions especially relate to California, there is much in the bulletin to interest any grower of cantaloupes.

A timely little circular is North Carolina's Ext. Folder No. 24, "Farm Program for North Carolina—1927." Eight points in good farming are set forth and backed because they have proven successful with many farmers in the state.

Other crop bulletins received this month include:

"Irrigation by Overhead Sprinkling," Agricultural Extension Service, University of California, Berkeley, Cal., Cir. 4, Nov., 1926, H. A. Wadsworth.

"Factors Influencing the Quality of Fresh Asparagus After It is Harvested," Agricultural Experiment Station, University of California, Berkeley, Cal., Bul. 410, Oct., 1926, C. S. Bisson, H. A. Jones and W. W. Robbins.

"The Relation of Sunshine to Crop Production," The Ohio State University Cooperating with the U. S. D. A., Agricultural College Extension Service, Columbus, Ohio, No. 39, Oct., 1926, Earl Jones.

"The Bimonthly Bulletin Ohio Agricultural Experiment Station," Wooster, Ohio, Vol. XI, No. 6, Nov., Dec., 1926, Whole No. 123.

"The Mica Ink-Cap or Glistening Coprinus," New York State Agricultural Experiment Station, Geneva, N. Y., Bul. 535, July, 1926, F. C. Stewart.

"Breeding New Varieties of Canning Peas," Agricultural Experiment Station, University of Wisconsin, Madison, Wis., Bul. 70, Oct., 1926, E. J. Delwiche and E. J. Renard.

"The Results of Eight Years of Practical Potato Spraying in Pennsylvania," American Potato Journal, Vol. III, No. 11, Nov., 1926, Washington, D. C.

"Report of the Director for the year ending Oct. 31, 1925," Connecticut Agricultural Experiment Station, New Haven, Conn., Bul. 274, Jan., 1926.

"Annual Report for the Year Ending December 31, 1925," College of Agriculture, University of Kentucky, Lexington, Ky., Cir. 196, May, 1926, Thomas P. Cooper.

Economics

"Variations in Costs of Producing Corn, Wheat, and Other Crops in Greene County, Ohio," Agricultural Experiment Station, Wooster, Ohio, Bul. 396, Sept., 1926, *J. I. Falconer and J. F. Dowler.*

"The Farmer's Standard of Living," U. S. D. A., Department Bul. 1466, Nov., 1926, *E. L. Kirkpatrick.*

Diseases

For many years orchards of this country have been sadly neglected with regard to method for control of diseases and insects. Gradually as larger areas have been planted and diseases and insect injury have become a more serious problem, control methods have been developed.

First we had simple spraying material and machinery, but newer and better methods have been rapidly brought to the front.

From the knapsack spray successively through the barrel sprayer, power sprayer, we are today on the verge of extensive employment of the permanent stationary spray plant.

A stationary spray system consists of a central pumping station and pipe lines laid systematically throughout the orchard. At regular intervals there are outlets, to which hose may be attached for spraying or irrigating.

The California Experiment Station is responsible for investigations leading to practical application of this system. A full report of the method with a full discussion of its advantages and disadvantages is given in *University of California Bul.* 406, by Professor B. D. Moses and W. P. Duruz.

Other bulletins include:

"Alternaria Rot of Lemons," Agricultural Experiment Station, University of California, Berkeley, Cal., Bul. 408, *Oct.,* 1926, *E. T. Bartholomew.*

"Paradichlorobenzene as a Soil Fumigant," Agricultural Experiment Station, University of California, Berkeley, Cal., Bul. 411, *Oct.,* 1926, *E. O. Essig.*

"Growing Plants as Possible Carriers of Anthrax," Agricultural Experiment Station, A. & M. College, Baton Rouge, La., Bul. 196, *Oct.,* 1926, *Harry Morris and Harland K. Riley.*

"The Common Chokecherry," Agricultural Experiment Station, University of Nevada, Reno, Nev., Bul. 109, *Mar.,* 1926, *C. E. Fleming, M. R. Miller, L. R. Vawter.*

"Studies of a New Fusarium Wilt of Spinach in Texas," Texas Agricultural Experiment Station, A. & M. College of Texas, College Station, Texas, Bul. 343, *July,* 1926, *J. J. Taubenhaus.*

Insects

"Notices of Judgment Under the Insecticide Act of 1910," *Insecticide and Fungicide Board, U. S. D. A., S. R. A. Insecticide* 56, *Oct.,* 1926.

* * *

Fertilizing 1927

(*From page* 26)

per acre of potatoes and some types of tobacco.

Vial has also published another report which shows that following a drop in values per acre of such a crop as cotton, the purchase of tax tags is very much delayed; that when as a result of this drop in values the tonnage is expected to be only 80 per cent, only about 20 per cent of the total tag sales were bought in November, December, and January and 75 per cent in February, March, and April. When the anticipated tonnage was larger, 33.5 per cent were sold in the earlier period and only 60 per cent in February, March, and April.

For this reason and because tobacco and potatoes are important factors in consumption this year, it is expected that fertilizer activity generally will continue until later in the season than usual.

At the time of his address Myers showed that estimates for consumption of fertilizers in the cot-

ton belt as a whole were 81.2 per cent of 1926 tonnage, but these estimates varied within the cotton belt itself. In some of the cotton areas consumption may be less. Where tobacco and potatoes are grown as well as cotton higher estimates of consumption will probably be realized. It should be urged very strongly, however, that these crops should not be over-planted. Overplanting with a resultant drop in values per acre in 1927 would be bad for both the farmer and the industry.

The foregoing is a very brief summary of the more important points contained in these reports.

WHAT do these findings indicate regarding a constructive policy in increasing fertilizer consumption?

1. The first urgent necessity is to help the farmer increase the value per acre of his crops on which fertilizers are or can be used. The importance of a balanced acreage, high yields, and better quality cannot be emphasized enough. Help the farmer to use his fertilizers in larger amounts on less acres. This will reduce the cost of production.

But values per acre are not easily increased. To accomplish anything needs the real cooperation of everybody who is interested in the profitable increase of fertilizer consumption in our national agriculture.

2. The second necessity is to take the burden off cotton and tobacco. Spread the use of fertilizer over more crops. The base is too narrow. When the values per acre of only two crops represent more more than 60 per cent of the factors which decide the total fertilizer consumption, it is time to get busy and spread the fertilizer base over a larger number of crops and in crop areas where little fertilizer is used as yet. When this is done, the drop in the value per acre of any crop would not cause the depression that now tends to occur. It is one way to eliminate the fat and lean years.

3. The third point—the total fertilizer consumption—is largely dependent on the values per acre of only four crops. These values go up and down and carry consumption with them. As long as these conditions persist any constructive policy might well include a large measure of adjustment to these factors. In making such adjustments, foresight as to how such factors are going to operate, that is, up or down in favor of consumption or not, would seem essential. It is then a matter of foreseeing the consequences and providing against them.

FORECASTING tonnage has a very definite place, provided it is properly used and provided its limitations are realized. It is not intended, of course, that such forecasting should stop the effort to sell fertilizers. It is merely an aid to judgment in showing what the conditions that one will have to contend with are likely to be. "Forewarned is to be forearmed."

For instance as consumption is largely decided by the values per acre of such a few crops, taking on more obligations before a drop in crop values would normally spell losses. These losses would not be offset altogether by lowering the price of the fertilizer, because on cotton at any rate price has been a less important factor.

4. The function of fertilizer prices as affecting consumption needs more careful investigation. The somewhat popular idea that the lower the price the proportionately bigger the output has not been the case. As Myers has pointed out, if fertilizer prices

were the only factor in increasing consumption, this might be so, but fertilizer price is not the only factor, provided the price is low enough to stimulate consumption, there are other factors more important that offset moderate variations in price. More work well might be done to determine the proper relationship of fertilizer price among the factors that influence consumption.

To summarize briefly, these findings would indicate that a constructive policy for 1927 should concentrate not on prices—they are low enough to stimulate consumption—but on showing the farmer how he can obtain the biggest value per acre by using fertilizers on a balanced acreage to produce higher yields of the best quality. Value per acre—it cannot be overemphasized. It is fertilizer industry's best salesman; the farmer's best friend. Both profit. Nothing that can be done will increase consumption so much as increasing values per acre.

Second, take the burden off cotton and tobacco. Spread the fertilizer base over other crops and areas.

Third, cultivate a cooperative spirit. The crop values that decide consumption are few, very few. They are very difficult to increase unless by cooperative effort, and happily the most productive cooperative effort that is needed includes the good of the farmer, as well as the industry.

The fertilizer industry is basic to the farmer and our national prosperity. As Myers points out the long time outlook is bright. Agriculture is becoming more capitalistic, less wasteful of labor. In the long run total consumption will undoubtedly again be steadily upwards, but until the present period of fluctuation has passed, the success of the fertilizer industry of 1927 between now and the spring depends more than anything else on getting together with the farmer, to show him how to obtain the biggest values per acre for the biggest number of crops.

As President Carter has often said "The industry and the farmer are Siamese twins." We never need to be better "twins" than right now.

* * *

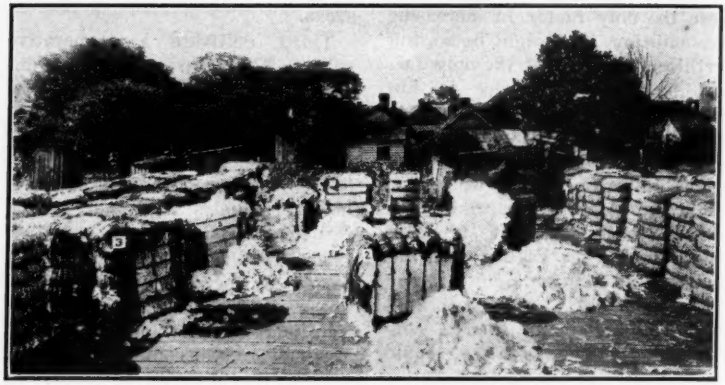
Weatherbeaten Cotton

(*From page* 18)

able, the best results come from placing the bales on poles and turning them once a week or at least after every rain. The bales handled this way lost an average of 19.5 pounds, or less than four per cent of their original gross weight.

Bale No. 1 which was kept in a warehouse, lost, on the average for the six trials, only four pounds. Those on end, bale No. 5, and left with the same end down all the time, lost an average of 117 pounds per bale. No. 6 which was on its edge on the ground and not turned, lost an average of 109 pounds, while the one, No. 7, on edge and turned after every rain lost only 64 pounds. It is evident that the loss was small on bales 1, 2, 3 and 7 in all tests. Bale No. 4 lost the most and No. 5 next, but far less than No. 4.

There are two stages of weather damage, Nixon says. First, damp cotton becomes mildewed. The fibers are not necessarily weakened, but the stain or discoloration of the fiber lowers its grade and cuts the selling price. Later the fibers



Bales being reconditioned. Note "pickings" from each bale

may decay, which first weakens them and destroys their spinning value, and later may destroy them entirely. During reasonably cold weather cotton will not decay much, but as soon as the weather gets warm, bales that have absorbed water begin to damage very rapidly. The only help is to open the bales and thoroughly dry them.

* * *

Nebraska

(*From page* 28)

Platte, Valentine, Mitchell and Union, the last named being an experimental fruit farm. It is estimated that the value of the experimental work of the college to farmers each year is approximately 26 million dollars in the added returns due to better methods developed and promoted by the college.

The first students of agriculture attended the college in 1874. But even a few years before that time the university had made the beginning with extension and experimental work which today has grown to such great proportions. Most people perhaps think of extension work as being of recent development but the institution was sending men out to conduct farmers' institutes in 1873-74. Experimental work was begun almost as soon as the university was opened, under the direction of Samuel R. Thompson, first professor and first dean of agriculture. Edgar Albert Burnett, present dean and director, has been associated with the institution for over a quarter of a century and it has been largely through his efforts that the institution has grown to its present prominence.

Fortunate for the future development of the state has been the work carried on by the experiment station with corn, Nebraska's basic crop, and the crop that has given it its present name—The Cornhusker Commonwealth. The rank of Nebraska as third in corn production, with only the eastern half of the state ideally adapted to growing it, is an outgrowth of the experiment station's constant efforts to increase the yield of corn per acre. Improved methods of preparing and cultivating the soil and better seed, things worked

out and advocated by the experiment station, have made these high yields possible.

The winter wheat area of the state was developed chiefly through the work of the experiment station. In 1900 the seed of hardy strains of Turkey Red and Big Frame wheat were sent out to 400 farmers with the result that the wheat production in the state was increased by more than 10,000,000 bushels per year. Work on the improvement of varieties of wheat adapted to Nebraska conditions was carried on constantly. The fruit of the results brought forth a new strain of wheat, known as Nebraska No. 60, which is considered the rival of the well known Kanred wheat from Kansas, lacking only a name. The great development of the previously unused lands of western Nebraska into wheat fields may be said to be one of the notable pieces of work accomplished by the Nebraska Experiment Station.

Oats, which became one of the State's most valuable grain feeds for livestock, were given attention at an early date. In 1897 a strain of oats, now known as Kherson, was brought over from Odessa, Russia, by a Nebraska professor, F. W. Taylor. It was found to yield several bushels per acre more than any other variety grown at this time. Constant improvement on this and other varieties has placed the state near the front in the production of oats.

The station has never lost sight of the possibilities of the small grain for Nebraska. Rye and barley, while not so extensively grown in Nebraska, are being improved by the station along with other small grains. At the present time hundreds of strains of corn, wheat, oats, barley and rye are being tried out on the extensive experimental plats at the agronomy farm.

Although the experiment station was not officially established until 1887, about 15 years after the College of Agriculture was established, experimental work was carried on from the very beginning. Professor Samuel R. Thompson began investigations in 1873 into the possibilities of the sugar beet for Nebraska. These early endeavors began what was to become one of the basic agricultural industries of the North Platte valley.

The sugar industry was probably more thoroughly studied in Nebraska than in any other place in the country. Especially during the late 80's and early 90's was the industry pushed forward through the unsparing efforts of Professor H. H. Nicholson.

During this time sugar beet factories were established at various points in the state, the best known one, and today the second oldest in the country, being located at Grand Island, Nebraska. The sugar beet industry, however, settled down in the most favorable place —the North Platte Valley, where, through the aid of irrigation, it yields the farmers millions of dollars income annually. And so, where prairie grasses once waved in the winds, and where no other plant life would thrive as well, sugar beets now grow by the tens of tons to the acre.

One of the finest examples of the inestimable value of the experiment station, was its development of the certified seed potatoes for the southern markets. Growers in northwest Nebraska, who once thought they had to import seed potatoes, now grow them and receive from 50 to 75 cents more per hundredweight for their crop as an outgrowth of this development. Last fall a potato special train journeyed into the Southland from western Nebraska and

disposed of thousands of bushels of seed at fancy prices.

Alfalfa was introduced into the state at an early date. It was found especially well suited to Nebraska conditions although contrary beliefs had been prevalent. This valuable forage and legume crop has become, with corn, the basic cattle feeding ration used by Nebraska cattle feeders. As a soil builder it has been as gold to many Nebraska farms. At present the experiment station is conducting intensive experiments on many varieties of the legume to determine not only yield in tons per acre but water content, leafiness, quickness of growth and quality and color after curing.

WHEN it is remembered that Sterling Morton, the founder of years ago, the work done by the experiment station in promoting the planting of fruit and shade trees will be highly appreciated. Southeastern Nebraska today is becoming known as one of the big apple districts of the Middle West. The need for trees to furnish protection and food was so keenly felt by the early settlers that even men outside of the station promoted tree planting. Among these the most distinguished one was J. Sterling Morton, the founder of Arbor Day, a tree planting day now nationally observed. The many kinds of trees which are now to be found in all parts of the state, especially along its lakes and rivers, and surrounding the thousands of farmsteads, add splendor to its scenic beauties.

The work of the substations is quite closely connected with the main station at Lincoln, Nebraska. The North Platte station, located at North Platte, Nebraska, was established in 1904 for the purpose of working out plans of operating the western Nebraska farm. A few years later two more stations were opened, one at Valentine, in the sand hill region and the other at Mitchell. These stations have accomplished much in determining which crops may be profitably raised in their areas. An 80-acre fruit farm was established near Union, Nebraska; and a 400-acre experimental farm a few miles away from the main experimental station at Lincoln is a recent development. The Nebraska School of Agriculture was opened at Curtis, Nebraska, in the western part of the state during the year of 1913.

The North Platte station rendered a valuable service in its investigation which made dry land farming possible in western Nebraska. Three outstanding things were worked out: (1) The proper cultivation of soil to conserve moisture; (2) Varieties of crops adapted to the conditions; and (3) the proper rates of seeding. Incidentally this station became the recognized leader of dry land farming investigations.

The Valentine station, by its investigational work showed that in the sand hill region alfalfa would do quite well, especially where there is sub-irrigation. Potatoes were tried and promised to become an important crop. Corn and small grain, investigations showed, would do well under the right conditions. Trees were found to do well with proper selection and care in handling them. And so, land that made poor grazing grounds at best, became agriculturally sound, simply because men were willing to try to make it so, even at the risk of ridicule.

For the station at Mitchell remained the work to be accomplished under irrigation. Aided by the United States Department of Agriculture, this station investigated the possibilities of growing

crops on irrigated land. Today this area of Nebraska is watered by the North Platte river.

While the crops of the state add much to the prosperity of its one and one-half million people, Nebraska is also one of the greatest livestock centres of the Middle West. Feeding experiments have been conducted for 25 years. As a fattening feed for cattle, corn, with alfalfa as a supplement, was repeatedly shown to be without equal. Nebraska now grows more corn and alfalfa than any other single state. Happily, these two crops fit wonderfully well into the various schemes of rotation.

These are some of the notable things which the experiment station has done to make Nebraska a greater agricultural state. As the span of years carry the work now in progress to completion, still other agricultural resources of the state will be discovered.

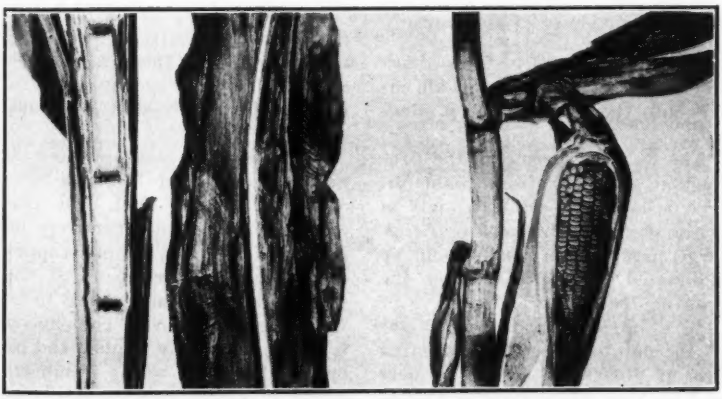
* * *

Potash Cures Corn Root Rot and Improves Yields

(*From page 6*)

aid in determining fertilizer needs. Experimenters have known for a long time that we must depend on the plant to reveal the fertilizer requirements of the soil. Thousands of elaborate fertilizer tests have revealed much valuable information as to the plant food requirements of the different types of soil. But in this Hoffer test we have a method by which a direct test of the corn stalk reveals the phosphate, potash, and nitrate deficiency of the soil in any individual field. The test is qualitative, not quantitative. It shows what fertilizers are lacking but does not tell how much will rectify the trouble.

This is the test. Choose corn plants that represent the majority type in the field. Do not pick the best nor the poorest but the average plants. Having obtained these average plants the stalks are split with a stainless steel knife and the chemical test is applied. A few drops of a weak solution of muriatic acid is applied to the cut surface of each joint, followed imme-



Darkening and rotting of joint tissues, firing of the edges of leaves and immature ear are effects of iron accumulations

diately with a drop of thiocyanate of potash solution. If there is any iron present in the sap tubes it will immediately turn a deep red. Next a drop of a mixture of sulfuric acid and diphenylamine is applied to the stalk tissue between the joints. If the plant has been getting plenty of nitrate the drop will turn blue.

A heavy red stain indicates that the soil is lacking in potash and the blue color indicates that the soil is supplying plenty of nitrate. When a soil is deficient in nitrate the leaves will be yellowish in color and the stalk test will give no reaction.

The phosphate deficiency is revealed in two ways. First the plants will be more or less stunted in their growth. The joint tissues of such plants will be dark in color and may be more or less rotted but when the iron test is applied there will be little or no reaction. This means that the plant is getting enough potash for its growth but is being held back by a lack of phosphate.

In making a test the nature of the growth of corn must always be kept in mind. For example a plant that is starved of phosphate will make a poor growth and such a plant will not require as much potash as would a larger plant. Hence if the test of the joints of such a plant reveals only moderate amounts of iron it is probable that when the phosphate deficiency is supplied the potash need will increase. In other words a relatively small content of the phosphate starved plant should serve as a warning that a phosphate potash fertilizer will probably be needed.

We must never forget that this corn stalk test is a relative test. It is not absolute. No one can predict the amount of fertilizer needed from the test. Use common sense with the test. Take into consideration all the factors of growth of the corn plant, the acidity of the soil, the previous crops, and fertilizers applied. This test is without question one of the most valuable recent contributions to agricultural science but it has its limitations. It is not the great panacea and no one should expect it to do more than Dr. Hoffer has specifically stated in Purdue Bulletin 298.

* * *

Eliminating the Waste in Agriculture

(*From page* 9)

be idle three-fourths of his time! This is economic waste and all enters into the high cost of production.

The waste occurring in the production of food, from plant insect pests and diseases amounts to enormous amounts each year. A large part of this waste could be eliminated by careful work on the part of the farmer.

In a single year the late blight of the potato caused an estimated loss of $10,000,000 to the farmers of New York State alone and probably $100,000,000 loss to the potato growers of the United States. Yet this disease and this loss can be eliminated by efficient spraying of the potato plant with bordeaux mixture.

The loss from smut or bunt in wheat is estimated to reach $25,000,000 annually. Yet, this disease can easily and effectively be prevented by the simple copper carbonate dust treatment of the seed wheat which has proved to be 100 per cent effective. The remedy is simple and easily applied and its universal use by wheat producers would eliminate considerable economic waste in the production of food on the farm.

Poisonous plants take an enormous toll every year from the livestock men. In the national forest alone it is estimated that 6,000 cattle and 16,000 sheep are annually killed from eating poisonous plants. Yet, the facts relative to the economic control and elimination of this waste are known and if adopted would result in a large saving to the stockmen who use the national forests and public range for grazing.

Poisonous plants are more dangerous at certain times of the year than at other times. Care must be exercised in pasturing on known poisonous plant areas during these periods. Plants that are stunted or wilted are more apt to develop poisonous principles than those which are normal and vigorous. Over-grazing must, therefore, be zealously guarded against. Various simple precautions of this sort would eliminate a large part of the waste due to animals dying from eating poisonous plants.

There is tremendous waste in farming poor land that is badly in need of drainage. Large areas of land under irrigation are heavily impregnated with alkali which could easily be eliminated by drainage. In humid regions there are vast areas of land which are so waterlogged that only poor yields are possible. These conditions add to the excessive cost of production of farm crops.

Soil erosion is another important way in which waste occurs in food production. Thousands of acres of land in the northeastern United States are being used for crop production which is adapted only for pasture or tree production. Such land under cultivation produces only poor crops and rapidly washes away. It should even now be allowed to revert to its native state.

Much land in the United States has been cropped so long and persistently that it is depleted of its readily available plant food. It is being farmed at a high cost of production. It should be built up by a definitely planned system of soil fertility by the scientific use of limestone, manure, legumes and commercial plant food. Such practices would result in higher yields with greater profit to the farmer.

THE economic merchandising of the crop produced by the farmer is of course very important, but it is valueless for the farmer to complain about our present system of marketing if the crop is produced at such a high cost of production as to prohibit a profit at any possible market price the consumer can pay.

There is, of course, a tremendous amount of waste in the marketing of the food products of the farm. The farmer himself has the power to eliminate much of the preventable waste in marketing of food products.

In many farm communities it is difficult to obtain any quantity of a uniform farm product because of the great number of kinds grown. The price is consequently reduced a few cents per bushel or pound and the farmer is loser thereby. Economic waste occurs due to lack of standardization.

In some sections of the country some good work has been done to eliminate this waste. The Kansas Agricultural College in 1906 developed a new wheat known as Kanred wheat which is well adapted to Kansas conditions. In 1923 it was estimated that 45,000,000 bushels of this variety were produced in Kansas alone, and undoubtedly within a few years this will be the principal, if not only, variety of wheat grown in Kansas. This is standardization and elimination of waste.

In the shipment of potatoes it is still the practice in many localities to ship all sorts, sizes and conditions of potatoes together. Large, fine potatoes are mixed with small, gnarly and bruised ones. The result is that the price is lowered to the producer since such shipments must of necessity be sorted at the shipping terminal and properly graded before they are sold to the consumer. The producer loses not only the weight of the discarded potatoes but also the freight on the shipment and cost of the labor of sorting.

From the evidence presented it is quite clear that much of the trouble with agriculture is due to the presence of preventable and economic waste in the production, transportation and marketing of farm products, and this waste must be eliminated before the problem is solved. Much of this waste can be eliminated by the efforts of the producer himself.

* * *

Ten Years of "Sightin' in Shots"

(*From page* 15)

influences, and it is not always possible to trace the "adopted practice" to the original promulgator.

Nevertheless, every farmer was asked to tell just how he happened to adopt the changed practice and to name the agency or agencies which had influenced him to make his decisions. In some instances it was apparent that they were adopted as a result of cumulative extension effort, no one of which could be credited for the whole result; in others, the adopted practice could be traced to a definite influence.

The various agencies or methods of teaching new and better practices were grouped in three classes for the purpose of analyzing the information gathered in this way. The first or personal-service group, includes such methods as farm and home visits, correspondence, office calls, telephone calls, study courses, leader-training meetings, and extension schools where systematic instruction is given. The second, or propaganda-group, includes meetings, bulletins, exhibits, circular letters, and news service. A third or object-lesson group, includes adult or junior demonstrations.

Propaganda seems to be the "big Bertha" in this barrage of knowledge. In this work it has proved that it merits the faith placed in it by politicians, movie actors, and numerous other forces that depend on propaganda to sway their public. Propaganda leads the three groups in influential strength and as a means of sowing the seed of new and better farm methods. It is given credit for placing new methods on 68 per cent of the farms making such changes. Its influence varied with the States, however, ranging from 51 per cent in one State to 92 in another.

OBJECT-LESSON methods influenced 58 per cent of the farms to make some of the changes they did, while the personal-service group was cited as influencing 27 per cent of the farms to adopt new ways.

The value of the different extension methods depends to a large extent upon the emphasis put on them but, in general, adult demonstration-methods have been more influential than any other single method. This agency was responsible for putting 42 per cent of the new practices on farms and in farm homes. Meetings resulted in placing 41.4 per cent of the new

practices on the farms; indirect influences, 26 per cent; news service, 10.9 per cent; bulletins, 10; farm visits, 9.8 per cent. Five per cent of the practices adopted were traced to the influence of office calls, 2.4 per cent to junior demonstrations, 1.9 per cent to extension schools, 1.5 per cent to correspondence, and .4 per cent to the use of the telephone.

In the main, extension work is highly approved by the great majority of rural people, 66 per cent of the farms in New York, Colorado, and California reporting as being favorable. Twenty-four per cent, or 1 out of 4, were recorded as indifferent to the work. Only 1 farm in 25 was reported as being actively opposed to extension activity, and while such opposition may be loud at times it apparently is not widespread among actual tillers of the soil.

The task of getting more farmers and more home makers to adopt the new and better practices as taught by the extension services is one which presents a challenge to extension workers. But with 10 years of extension results as a background on which to draw for information and courage in the conduct of future work, it is not impossible of attainment.

* * *

The Corn Royalty of the U. S. A.

(*From page* 13)

form, measuring 10¼ inches in length, 7¾ inches in circumference, containing 20 rows of kernels and weighing 25 ounces. The boy's sample was almost equally uniform in size and weight.

The land from which the champion corn came is what is commonly called "sugar tree land," a rather heavy, dark clay, only fairly naturally fertile. Mr. Lux has built up this land through proper fertilization and good farming methods until he not only gets corn of the best show type but also yields that compare favorably with those from regions with much richer soil.

The 22-acre field from which the prize winning sample came averaged 94 bushels to the acre, all of it husked by hand before the International which opened Nov. 27. But, let Mr. Lux tell his own story.

"We had this field in sweet clover in 1925, pastured heavily with hogs and cattle all summer, then in the winter we hauled about eight tons of manure to the acre covering the whole field," said Mr. Lux. "We plowed early nearly 10 inches deep, to turn under the manure and the heavy growth of sweet clover, and had the seed bed in final shape at planting time. Then, we sowed 90 pounds to the acre of 0-10-10 fertilizer in the row. The corn was cultivated three times, each time a little shallower than before, and it was well matured before heavy frosts which came to us late in October.

"One thing I learned several years ago from Dr. George Hoffer of Purdue University, who conducted a demonstration for a number of county agents in our part of the state, was that we were not using enough potash in our commercial fertilizer. We generally used a 2-12-2 or similar mixture. To make a long story short, we changed our analysis to include more potash and have been using it since, especially the last two or three years."

"What results have you obtained from this change?" Mr. Lux was asked.

"In the first place we increased our average yield of corn about 12 bushels to the acre. Then, it helped mature the corn more evenly. Formerly we got from 30 to 40 per cent of our corn suitable for seed and this past season, even though the year was bad on corn, we gathered 62 per cent for seed.

"I learned from John Trost at Purdue, who has been working on seed corn improvement work in Indiana for several years, about better seed selection methods. For the last several years I have picked seed ears that were well matured on green stalks still standing, and avoiding the mature ears on dry stalks which we found usually were diseased."

Mr. Lux stated that through this system of seed selection and proper fertilization he had been able to shorten the growing period required by his strain of corn about 10 days, a factor of great importance in many seasons.

* * *

New Potash Facts

(*From page* 16)

tained in 1926.

An application of 400 pounds of potash per acre produced a surprising yield of 800 bushels of carrots per acre on this type of soil. The roots were of a very fine shape, size and quality and it seems clear that where a market is available this crop can be produced to advantage on this type of soil if properly fertilized.

* * *

From the Fields to the Sea

(*From page* 23)

says Mr. Bennett, "to be of any value must be on the basis of soil type. Any other method of procedure will be wasted effort, for what suits one soil may injure a type of different nature.

"There is need at once for a nation-wide awakening to the evils of soil erosion. There is immediate need for fundamental soil data relating to erosion, demonstrations far and wide of the effectiveness of properly built terraces, reforestation demonstrations, and much national education on this menacing agency of land devastation."

Even gentle slopes frequently need terracing

Auctions

(*From page 27*)

ing value have not been satisfactorily determined.

Considerable thought and study are being given to this question of standards for evaluating crops, and indications are that within the next decade the standard for determining quality and price will be so stabilized that any farmer knowing the requirements for almost any standard grade of crop will be able to produce it.

Already the tobacco interests in this country are taking a definite stand in this matter. Auctions in imporant tobacco centers are being advertised in a world-wide campaign. Contemporaneous with this movement has developed what might be termed "A University for Tobacco Auctioneers"—this on the warehouse floors of the leading markets. So strenuously have agricultural workers waged their campaign for better quality tobacco as influenced by cultural and fertilizing methods that both fertilizer men and tobacco auctioneers appear to be anxious.

During the past few years fertilizer men in the tobacco regions have shown a disposition to manufacture brands of fertilizers based on the requirements of the crop, as recommended by federal and state agricultural experts. The writer two years ago while on a tour of tobacco markets in the South was astounded by the lack of any definite standard for determining price of tobacco. The buyers wanted quality, of course, but apparently they did not associate quality characteristics with proper fertilization.

On a recent trip to the largest bright flue-cured tobacco market in the world at Wilson, N. C., the writer had the privilege of witnessing what appeared to be a decided change in judging tobacco. Buyers examined the leaf with considerable more ease, and many admitted that they were interested in the source of the tobacco, and how it was fertilized.

Through individual farmers, the history of the fertilization of certain lots of tobacco was given the writer. These lots had been fertilized with a real Gem brand—a highly recommended formula, and were of excellent quality. Though their location on the warehouse floor was not known by the buyers, when these lots were reached the buyers became intensely interested.

There is where the story hinges. Proper fertilization does produce visible characteristics of the leaf which are associated with quality. Buyers are learning to bring these two points in focus, and the price paid for the leaf is today to a large extent based on its actual quality.

More attention must be given this question of standards for judging quality and price before the farmer can be expected to receive a premium for his efforts in growing quality tobacco. It is very obvious, however, that progress is being made and all that remains to be done is to bring into a closer working relationship the farmer, the fertilizer manufacturer, the tobacco buyers, and the federal and state agricultural authorities.

* * *

"Yas-suh, jedge," affirmed a very large and indignant lady of color, "instead ob he'pin' me up when dat street car knocked me down, dat no 'count husband ob mine slapped me!"

"Did you do that?" the judge sternly demanded of the diminutive defendant.

"Yas-suh," was the defiant reply; "dat was de chance ob a lifetime!"

Blow the Smoke Away

By P. M. Farmer

¶ Will you have some smokeless bacon?

THE old smokehouse with its unctuous interior and walls and rafters browned with hickory smoke, once a most important part of the equipment of every farm, long ago felt the competition of the big packing plants. More recently it has been pushed farther from its foundation by those who offer more or less satisfactory substitutes for the old method of imparting that sublime flavor of the fire to bacon, ham and sausage. Nowadays, if we read the claims of various manufacturers, we must be set to wondering just what wood smoke really is—product of combustion or of the chemist's ingenuity.

In the effort to do away with the smokehouse some manufacturers actually have trapped the smoke of woods commonly used for the purpose by mixing it with salt in the presence of warm air in rotating drums. The product is actually smoked salt, and it is claimed that by its use the smokehouse may be eliminated and the curing and smoking processes combined with a saving of labor and other expense. The farmer who has his favorite formula for curing meat, it is said, will not find it necessary to adopt a new one with the use of this product, but may mix the smoked salt with the other ingredients that go with salt and go ahead as usual.

One manufacturer says that the treated salt (smoked with hickory wood), taking the place of the smokehouse, prevents shrinkage which results from the fire in the old process, flavors the meat more deeply because it doesn't dry the hams and bacon, prevents spoilage, and cuts out the fire hazard.

Pyroligneous acid, a chemical sold in liquid form for treating meat in place of smoking, is derived from wood but is not smoke and is not made from smoke, although efforts are sometimes made to give the impression that it is smoke. It is made by the destructive distillation of wood and much of it is made as a by-product of the manufacture of wood alcohol. Salt is sometimes treated with this chemical to make a meat-curing product called smoked salt.

The appearance of these different products on the market has brought up the question as to just what wood smoke is. Obviously it is not made by distilling wood for that process does not involve burning. Although the Bureau of Animal Industry of the United States Department of Agriculture, which enforces the Meat Inspection Act, will not permit anything but meat actually smoked to pass in interstate commerce as smoked, it has not officially defined wood smoke, and neither has the Food Standards Committee of that department. An official of the Bureau of Animal Industry,

(*Turn to page* 63)

Knowledge

(*From page* 4)

worm's belly—but I suspicion that some pseudo-scientist read Binet's treatises in a fog of misunderstanding.

Binet is all right. He has given us some good ideas. Through his systems it is possible to ascertain to a nicety a person's inherent *intelligence*—and intelligence has the same relationship to knowledge that a spy-glass has to the sun toward which it is directed, and no more.

KNOWLEDGE is of two kinds —that which you know, and that which you know where to get quickly.

The idea that an educated person is one who has crammed his cranium pack-jam-full of heterogenous, stray bits of fact is *erroneous.*

Facts are tools. The carpenter does not clutter up his bench with his hammers and saws and chisels. He hangs them handy to his hand. But the working space is clear for the daily task.

So, the thinker relies upon reference books for *facts.* He keeps these guides handy, but preserves his mind clear for action.

It is unimportant for us to remember "what is the lowest dry land region on the earth's surface?" or "Which of our Presidents were bachelors?" But it *is* important for us to know the multiplication table if we are going to study trigonometry. It is too annoying to have to refer constantly to a text book to discover how much is six times nine whenever that information is needed, and so we commit the simple table to memory, and it stays with us.

Certain facts, then, being basic and contributory to an understanding of more important things are well to have in mind. But to make of the brain a cluttered attic for the permanent and dusty storage of seldom used odds and ends of names, dates, statistics and measurements is foolish.

Herbert Spencer, in his *Essay on Education* says: "The remark is trite that in his shop, or in his office, in managing his estate, in playing his part as director of a bank or railway, the college graduate is little aided by his knowledge he took so many years to acquire—so little that generally the greater part of it drops out of his memory."

What, then, is the use of an education? I think that the greatest value in schooling comes from contact with others, the full appreciation of the value of team-work, the correct habits of application and study—and, most important, the discovery of the *keys* to knowledge.

I should say that if a young man upon leaving college forgot every language he had learned, every fact about biology, philosophy, and other ologies and "osophies" he had so assiduously crammed, but had assimilated a knowledge of how to work harmoniously with other men the time was not entirely lost.

If he forgets the chemical formula for hydrogen cyanide but has formed an enjoyable habit of studious concentration amid clattering disturbances his schooling was good for him.

Let him struggle unavailingly to prod his memory for the answer to "at what place can a ship sail eastward from the Atlantic into the Pacific?" and it will mean nothing if in college he learned where to find the answer at once.

ELBERT HUBBARD said: "The man who knows is the man who has a secretary who knows where to find the man who knows." And knowledge is simply the

knowledge of where knowledge is to be formed.

I shall never forget the exclamation of astonishment that escaped from the lips of a friend of mine who, in browsing about my library shelves, came across my rhyming dictionary. "A rhyming dictionary!" he exclaimed, and hastily opened it to see in what form its alluring contents were arranged. When he found that he could in ten seconds find twenty or thirty words to rhyme with "time" he closed the volume with an angry, disillusioned snap.

"To think of the time I have wasted" he said. "No wonder you can write such beautiful verse!" And then he confessed something that I had understood for years: that if he had not inadvertently become through inheritance an importer of Norwegian dried herring he would have been a poet.

He has a poet's soul and understanding of the finer, tremulous emotions. Occasionally, he told me, he attempted for his own pleasure to put down on paper some of the surging poesies that swept through him; but always the deadly hunt for the proper word killed his imagination.

"And to think that all of the time there was a book patiently and, I suppose lovingly, assembled by some unknown hero, containing all the rhymes neatly brought into orderly, harmonious relationship!"

Think of the time that is wasted by strugglers who know not where knowledge is locked up, and who have no key to the amassed contributions of previous generations to our worldly philosophy!

"A man would die in the first alcove" before he had read through all the books that lie in the library entombed in silence. But if he knows what knowledge is there and can get it when he wants it, it is as valuable as if he tried to store it in his brain.

GENERAL knowledge is not necessary to a worldly success. More successful men successfully escaped college than went through it. Morgan was a college man, but Carnegie was not. Emerson was university bred, Conrad self-taught in the University of Hard Knocks.

But a general knowledge is necessary to an enjoyment of those things in which a worldly success permits a man to indulge himself.

The millionaire who retires to travel is dead though he still walks, unless he has accumulated along with his money a true appreciation of man and his works.

Better than a knowledge of facts is an understanding of men and the world, gathered through experience. To know the psychology of men's minds is to be a leader of men; to sympathize with and realize the intensity of their emotions is to live more fully; to read history and biography—and forget the facts, having once read them—is to gather an appreciation of this world and its struggles that aids us in placing ourselves strategically.

But the greatest and most important knowledge of all is not taught in books. It is knowledge of yourself. You can study yourself from now until your last day on earth, and not a moment will be misspent or unprofitable. After all, you are *real* and the world and its knowledge *unreal*.

"Know thyself" and the rest will come, whether you can remember "the four kinds of venomous snakes found in the United States" or not!

* * *

NO COMPETITION

Mandy—"Mose, is yo' sho' yo' didn't marry me fo' mah job?"

Mose—"Co'se ah didn't, gal! Lawsy, no! Yo' jes go ahaid an' *keep yo' ol' job!*"

Blow the Smoke Away

(*From page* 60)

however, once defined wood smoke:

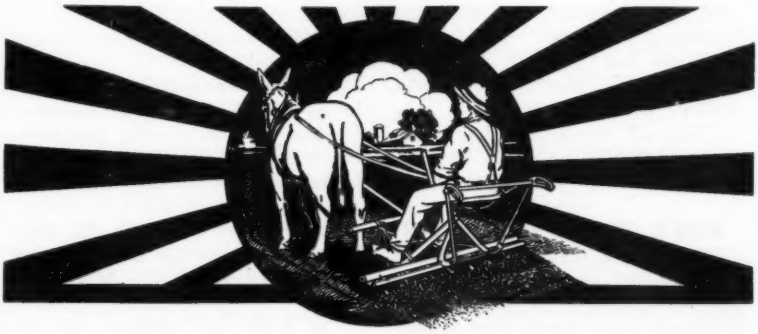
"Wood smoke consists of the volatile products resulting from the combustion of wood together with the heated air which passes through and over the fire, and also the finely divided solid and liquid particles mechanically transported by the mixture of gases and air."

Efforts are being made to induce the Department of Agriculture to recognize and approve meat treated with smoked salt—that is, salt actually smoked with smoke that would come under some such definition as that given above. At present the use of these products is limited almost entirely to farm curing.

DON'T EVER QUIT

When things go wrong, as they sometimes will,
When the road you're trudging seems all up hill,
When the funds are low and the debts are high,
When you want to smile, but you have to sigh,
When care is pressing you down a bit—
Rest if you want—but don't quit.

Success is failure turned inside out—
The silver tint of the clouds of doubt,
You never can tell how close you are,
It may be near when it seems afar,
So stick to the fight when you're hardest hit—
It's when things seem worse that that you mustn't quit.—*Tranquillan.*



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COULDN'T STAND THE PACE

Immediately after the wedding supper had been consumed, Mose Johnson and his blushing but ample bride departed on a motor honeymoon trip. But just as the last of the more hungry wedding guests were saying good night, the badly scared-looking bridegroom returned to the scene but without either his car or his bride.

"Mah goodness, Mose!" his mother-in-law demanded, "what's de matter?"

"Us runs into a telefoam pole out by de cemetery," was the breathless response.

"Lawd hab mercy!" exclaimed the bride's mother, "wheah's Iodine. Was she kilt?"

"No'am," explained the bridegroom; "she'll be heah d'rectly. She jes couldn't keep up."

BOTH WERE MISTAKEN

A pompous man missed his silk handkerchief, and accused an Irishman of stealing it. After some confusion the man found the handkerchief in his pocket, and apologized for having accused the Irishman.

"Never mind at all," said the latter. "Ye thought I was a thafe, and I thought you was a gentleman, an' we were both mistaken." —*London Telegraph.*

"My son," said the fond mother, "you must not shoot craps, for life is just as precious to the poor little craps as it is to us."—*Florida Farmer.*

YOUTHFUL REASONING

Archie, five years old, had found a cat and given it the name of Mary.

"Why did you give it a girl's name?"

"Well," replied the youngster, "I saw her washing her face and she washed her ears and she washed behind her ears, and nobody but a girl cat would wash behind her ears."—*Boston Transcript.*

Think this one over. We tried it for an hour or so and almost came to blows with three arguflers, each of whom had a different solution. What's yours?

A debtor seemed really anxious to settle a $3 delinquent account. He had only $2, a crisp new two-dollar bill. He took it to a pawnbroker and pawned it for $1.50. He sold the pawn ticket to a sympathetic friend for $1.50. He then had in his jeans the much desired $3 and settled the bill. Who lost?

"If I ate my mother and my father what would I be?"

"Why, you'd be a cannibal, of course."

"Tut, tut, thick one, I'd be an orphan."—*Exchange*

THE RULING PASSION

Ben: "Where's the boy who used to wave a red flag in front of a bull?"

Eben: "Oh, he's running a red roadster in front of express trains now."—*Allston Recorder.*

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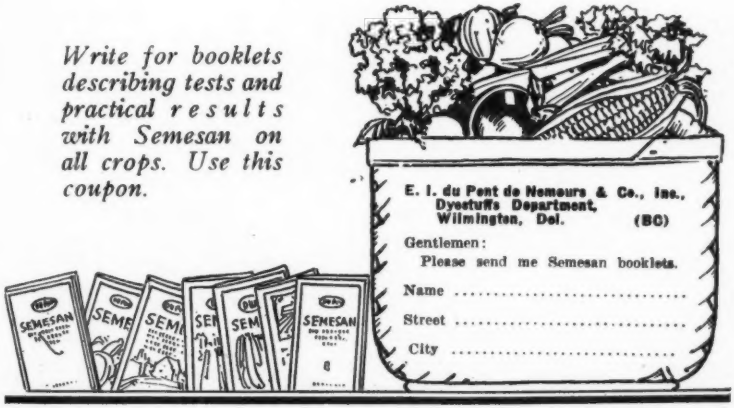

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The story
your peach trees tell

DO you study your peach trees carefully and check up on the new wood growth each season?

Experience has shown that some nitrogen is necessary on nearly all peach orchards. But nitrogen is much more effective and can only perform its functions to best advantage when it has sufficient potash and phosphoric acid to work with.

The photograph shows two bundles of 10 cuttings each of new wood growth from two peach orchards in Placer county, California gathered early this year.

These two orchards growing the same varieties were on the same soil type, and received similar care except for fertilization.

The kind of fertilizer made this big difference in fruiting wood growth.

The smaller bundle came from an orchard fed nitrogen only. The larger bundle came from an orchard fed 10 lbs. per tree of a fertilizer analyzing 5½% nitrogen, 11% phosphoric acid and 16½% potash. You can readily see which orchard will yield the better crop and greater profit.

Potash is just as essential in making good, well flavored fruit with firm carrying qualities as it is in the development of healthy fruit producing wood.

Whatever plan of fertilization is followed your trees of bearing age should receive from 1 to 2 lbs. of actual potash per year—preferably in a mixed fertilizer.

For best results apply the fertilizer in the fall, winter, or early spring. Where rainfall only is depended on, it may be applied before the winter rains begin.

A careful examination of your trees will quickly show whether they are suffering from potash hunger. If you have any doubts or questions write our Soil and Crop Service.

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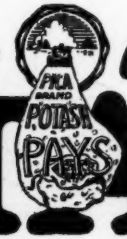

POTASH